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THE UNIVERSITY OF ALBERTA

# ABILITY-FACTORS AND FAMILIAL PSYCHOSOCIAL CIRCUMSTANCES: CHINESE AND MALAYS OF SINGAPORE

by

PHUA SWEE LIANG

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Ability-Factors And Familial Psychosocial Circumstances: Chinese And Malays Of Singapore.

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in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Educational Psychology.

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## Abstract

The two main purposes of this study were: 1.a) to investigate the patterns in a domain of school-related ability-factors across two samples of Singapore Chinese and Malay 14-year-old male pupils, and b), c), d) to similarly examine factor patterns in affective, process, and status domains of familial circumstances; and 2. to examine how the ability-factors relate to the affective-, process-, and status-factors.

An ability domain of 32 test measures was selected to define seven school-related elementary common factors. Principal component analysis followed by Promax oblique rotation produced nine first-order factors underlying this ability domain for both Chinese and Malay data separately. Loading interpretations confirmed by a mathematical factor-match identified eight equivalent factors across the Chinese and Malay patterns. These were Inductive Reasoning I, Number Facility, Flexibility of Closure, Speed of Closure, Spatial + Visualization, Verbal Reasoning, School-achievement and Inductive Reasoning II. The hypothesis that the emergent factors in both Chinese and Malay patterns would resemble the input factors defined by the tests selected, was confirmed in that the first seven above listed factors matched the predicted factors. Another hypothesis predicting the Chinese School-achievement factor to be more differentiated from its other within-pattern factors than its Malay counterpart would, was supported by the Squared Multiple Correlation between School-achievement and its corresponding within-pattern factors.

On the basis of Euro-American findings and the socio-cultural characteristics of the samples, three domains of familial psychosocial variables - affective, process, and status - were selected and the factors underlying each were in turn identified. The three factors in the affective domain were equivalent across Chinese and Malay patterns and resembled the three Schaefer original factors of Acceptance vs Rejection, Psychological Control, and Lax vs Firm Control. The two Chinese and Malay equivalent process factors were interpreted as Learning Environment and Independence vs Parental School-achievement Motivation. With respect to the status domain the two clearly equivalent Chinese and Malay factors were Elder's Occupational-Educational Status, and Sibling Size vs Maternal Occupational-Educational Status. The two remaining Malay factors, Paternal Occupational-Educational Status and Material Index represented components of the Chinese Paternal Occupational-Educational Status + Material Index factor while the unrelated Chinese factor was interpreted as Home Induction to School Languages.

Intercorrelations among factors within the domain-pairs of ability-affective, ability-process, and ability-status, and canonical correlations between significantly correlated psychosocial-factors and ability-factors were rather low, indicating weak across-domain relationships for both Chinese and Malay samples. A hypothesis stating that relative to the affective and status domains, the process domain would exhibit the strongest link with School-achievement and Verbal Reasoning was not confirmed.

A major finding of this study, which is in contrast to Euro-American findings is the weak relationship between familial psycho-social circumstances and ability-factors. This finding indicates that for these subjects school effects are much more independent of the nature of the homes than what have been found in Euro-American settings.

The above finding has important implications for theory in that it draws attention to the fact that the relation of familial psycho-social circumstances to ability-factors has to be viewed in the context of the relative interplay between the home and school in fashioning the abilities. It has notable implications for practice in that it points to the potency of schooling and suggests that Euro-American type of education may be implemented in schools irrespective of the nature of the homes.

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# CHAPTER I

## GENERAL PROBLEM

The present study investigates the major underlying dimensions characterizing a domain of tests measuring school-related abilities, and examines the generalizability of Euro-American trends concerning the relation of differential abilities to familial psychosocial circumstances for Chinese and Malay boys of Singapore. These are two non-Euro-American ethnic groups differing in traditional cultures but having been inducted to a common English-instructed Euro-American-evolved type of schooling.

Coherence among tests within the ability domain has been fruitfully demonstrated through factor-analytic studies. Depending upon the theoretical rationale and the factoring technique adopted, different but reconcilable patterns among tests have emerged. Thus factors, such as verbal-educational (v:ed), spatial-perceptual-practical (k:m), and inductive reasoning (i) (Vernon, 1969; MacArthur, 1973; 1974); fluid (Gf) and crystallized (Gc) intelligence (Cattell, 1963; Horn & Cattell, 1966); Visualization (Gv) and Speed (Gs) (Horn, 1968); the well-known and extensively used Thurstone's Primary Mental Abilities (PMA) of Verbal (V), Number (N), Reasoning (R), Space or Visualization (S), Perceptual Speed (P), Inductive Reasoning (I), Rote Memory (R), Deductive Reasoning (D), and Word Fluency (W) (Thurstone, 1938); and the cognitive factors associated with the French, Ekstrom, and Price (FEP) kit of reference tests (French, et al, 1963); represent some of the functional unities commonly identified within the mental ability domain. Generally

factors like the PMA or the FEP primary abilities are considered to be more elementary or narrow abilities while those like v:ed, k:m, Gf, Gc and their equivalents represent broader abilities.

Empirical studies on the patterning of abilities, taken together, indicate that the elementary primary abilities of the FEP type appear to be stable both within Euro-American cultures (Hakstian & Cattell, 1974), and across diverse non-Euro-American cultural groups which have been inducted to the Euro-American system of education. This provides a basis for the establishment of similar abilities to be used for group comparisons into the relation of abilities to familial psychosocial circumstances.

Investigations into the relationships between home environmental characteristics and mental abilities generally adopt one of two common procedural approaches. One approach involves directly measuring postulated effective environmental variables and studying the extent of association these have with the particular abilities of interest or molar measures of them. The other approach is associated with group comparisons of patterns of abilities. This methodology of investigation involves identifying cohorts of subjects who are characterized by a particular environmental characteristic and examining their patterning of abilities.

Both these lines of investigation have uncovered a wide range of possible environmental correlates of mental abilities for Euro-American cultural groups. Generally they fall into three main categories; namely, affective (Hurley, 1965), process (Bloom, 1964), and status

variables, which in the context of this study will be subsumed under the generic term 'psychosocial' variables. Affective variables may be viewed as the emotive-experiential accompaniments of parent-child interactional processes that are likely to affect the child's inclinations to explore the 'physical, interpersonal, and ideational aspects of the environment'(Hurley, 1965; p. 19), such as warmth, hostility and affection. Process variables concern the more dynamic and purposeful interactions between parent and child that bear directly on the cognitive development of the latter; examples of these are, 'Parental Aspirations for Child's Education', 'Direct Teaching Activities', 'Educational Activities', and 'Encouragement for Activeness'. Finally, status variables represent the more tangible aspects of the home, such as family structure, or socioeconomic indicants like parental occupation, amount and quality of modern appliances, and other similar forms of material wealth.

Individual studies vary in the emphases given to particular categories of home environmental variables, but comparisons on the relative degree of association between status and process variables, each separately with abilities have been made. In the last decade, a series of studies pioneered by the works of Wolf and his colleagues at Chicago (Wolf, 1964b), have to a large extent established the relatively stronger association between the process variables and mental abilities. Similar comparisons have yet to be made with the affective category, but suggestive evidence presented by child developmental studies (Hurley, 1965; Horn, 1970; Bayley, 1971), calls for consideration to be given to

this category of familial psychosocial variables.

Arising from the potpourri of studies on the relation of abilities to familial psychosocial circumstances are the consistent findings on the relatively stronger link for process variables. The cumulative learning models of abilities (Hebb, 1949; Piaget, 1964; Ferguson, 1954; 1956; Gagné, 1968; Horn, 1968) have presented a case for early learning in the home. Considering that the home is the child's first encounter with his learning environment, what is learnt there represents the prerequisite learning upon which the school can build related and more complex skills. This is particularly so for verbal abilities in Euro-American context, where the home and school mutually reinforce each other in fostering these abilities. Whether this relatively stronger link in favour of process variables can be generalized to groups for whom the home and school are not mutually reinforcing institutions is a moot point.

There have been indications from some Euro-American studies that absence of familial psychosocial supports for ability development can be compensated by schooling effects. A case in point is this observation made by Douglas et al (1968).

> "...deficiencies of interest and ambition on the part of parents are, to a large extent, offset by good teaching". (p. 179)

It may be argued that this compensatory role of schooling effects can also be extended to other familial psychosocial variables. Horn and Vernon have frequently underlined in their writings, that some abilities can be developed under the aegis of the school, and some of Vernon's

cross-cultural findings (1969) have reflected this. A stronger case can be made for this compensatory function of schooling for children whose verbal abilities have been measured and developed primarily through a language not frequently used in the home. Clearly, in such a situation, the more crucial factor is the child's own responsiveness to schooling.

Circumstances which would affect this responsiveness to schooling are more likely to be nutritional and health conditions, or even genetic equipment . In reality, these 'factors' often go along with status variables such as socioeconomic status, and educational and occupational level of parents. Status variables per se may not contribute substantially to the link of familial psychosocial circumstances to abilities, but when they operate as indicators of such underlying familial psychosocial circumstances, then their impact may be realized. In addition, affective variables may also affect the child's responsiveness to schooling in that the type of discipline he receives at home may, or may not equip him with the mental discipline for school work.

In the light of the preceding discussions, the purposes of this study are: 1.a) to investigate the patterns in a domain of school-related ability-factors across two samples of Singapore Chinese and Malay 14-year-old male pupils and b), c), d) to similarly examine factor patterns in affective, process and status domains of familial circumstances; and 2) to examine how the ability-factors generated relate to familial psychosocial circumstances that Euro-American studies have consistently identified as correlates of abilities.

## CHAPTER II

## SURVEY OF RELATED LITERATURE

### Patterns among Mental Tests

The theoretical and methodological substrate for structuring within the mental ability domain had its genesis in the two-factor theory of Spearman (1927). Examining the consistent phenomenon of positive intercorrelations among the varied putative intelligence tests of his day led Spearman to formulate, by means of the tetrad technique, the theory that every ability has two underlying components namely, a general mental capacity factor 'g', which is common among all tests, and a specific factor 's', which is unique to the particular cognitive task. In operational terms, 'g' is the capacity to 'perceive relations and educe correlates'. It depends on the mental energy one is endowed with at birth and hence is innate and relatively fixed while the s-factors are largely the crystallizations of education and training related to the task (Vernon, 1961; p. 13).

A shortcoming of Spearman's theory lies in its omission of intermediate group factors between the all-embracing 'g' factor at one extreme and the unique s-factors at the other. Empirical data tended to negate the practical validity of the theory, and rather to point to the existence of broad group factors which arose as a result of overlapping between s-factors.

The question of a nexus between the s-factors was approached by Thurstone's development of the multiple factor analytic technique

(Thurstone, 1931). In 1938, he applied this analytic tool to ability data and obtained what appeared then, to be a totally different structural picture of the intellect from Spearman's. Thurstone's result established the existence of a series of distinct primary factors, of which the well-known and extensively used Thurstone Primary Mental Abilities (PMA) were: Verbal (V), Number (N), Perceptual Speed (P), Inductive Reasoning (I), Rote Memory (R), Deductive Reasoning (D), Word Fluency (W), and Speed and Visualization (S). Later analytical studies demonstrated that Thurstone's PMA and Spearman's 'g' were reconcilable in that further factoring of the PMA produced a single factor. A more comprehensive mapping of primary abilities was subsequently undertaken by French (1951) and later revised by French, Ekstrom, and Price (1963). A more recent study by Hakstian and Cattell (1974) demonstrated the replicability of some of the French, Ekstrom and Price (FEP) primary abilities.

Burt (1949) introduced the concept of hierarchy in the structuring of abilities. His hierarchical structure consisted of an overall general ability which subdivides into two broad group factors of intellectual ability and practical ability. These two broad factors in turn could undergo further differentiation into minor group factors, three of which had been identified as mechanical memory, visual perception, and motor dexterity.

Vernon advanced Burt's hierarchical theory by elaborating on a more fully differentiated model (1965; 1969). His model is analogous to a genealogical tree, with 'g' the 'universal' among all tests at the

peak. Once the 'g' component is removed, the residuals of tests fall into one of two major factors - verbal-educational (v:ed), and spatial-perceptual-practical (k:m). Each of these can be further subdivided into more minor group factors such as verbal fluency, number, and the creative factors under v:ed and spatial, psychomotor, and mechanical information factors under k:m. Finer sub-division of these minor factors into specific factors of the Spearman-type is also possible, but these according to Vernon, are too trivial to be of any significance. Vernon also drew attention to the likelihood of intermediate group factors between the major and minor group factors.

Integrating the Burt-Vernon hierarchical structure and Thurstone's PMA pattern is Cattell's theory of fluid and crystallized intelligence (1963). This theory distinguishes between two distinct, but 'interrelated and cooperative' factors above the level of Thurstone's PMA, which Cattell called fluid (Gf) and crystallized (Gc) intelligence. Subsequent testing and revisions of the theory (Horn & Cattell, 1966; Horn, 1966; 1968; Cattell, 1971) led to the crystallization of the Triadic Theory of ability structuring. According to the present form (Hakstian & Cattell, 1974), the organization of abilities may be conceptualized to be at three levels - 1) the highest order stratum of broad capacities of which the original fluid and crystallized intelligence are but only two examples, 2) the intermediate stratum of 'provincial powers' such as visual and auditory organizing powers, and 3) the first order stratum of primary abilities, which in this theory has been given the psychological term of agencies by Cattell. The relations between these

strata have also been diagrammatically represented (Horn, 1966b; p. 557, Horn, 1972; p. 498).

There are other models for describing structurings among tests but for the purposes of the present study the above discussion will suffice.

Ability-factors and Environmental Experiences

Parallel to the developments achieved in describing the wide range of mental tests parsimoniously in terms of ability-factors or patterns were also efforts made to relate such factors to environmental experiences. Thus, Spearman's s-factors represented the component of tests that are largely the result of education and training related to the specific task. Vernon has made frequent references to the emergence of factors through contiguous educational and training experiences. He underlined that any factorial pattern or structure is not invariant but can change, depending on the type of education and training. Inherent in Tryon's second mechanism in accounting for intercorrelations among tests was also the recognition given to environmental influences (Anastasi, 1970; p. 900).

Cattell's Triadic Theory established a more definitive link between ability-factors and environmental circumstances during development. An important aspect of the theory lies in the integrating principles advanced to explain how primary mental abilities become organized into broad capacities like Gf and Gc. In his initial formulation of the theory, Cattell gave the impression that Gf represented innate capacity, uninfluenced by nurture, while Gc represented the interactive

product of an individual's Gf and his culture. Subsequent refinements of the theory, as noted above, led to modifications in the interpretations of Gf and Gc, and hence the nature of environmental experiences associated with the development of each. The basic conceptual difference between Gf and Gc is best given in this statement by Horn (1966b):

> "The distinction between Gf and Gc is thus not conceived as a difference between physiological and experiential origin but between two kinds of experience in which the physiological potential becomes expressed." (p. 555)

Gf experiences represent the relatively common aspects which are essentially universals in our physical world whereas Gc is closely linked with the more culturally embedded experiences.

The articulation between ability organizations and learning finds expression in the learning theories of Ferguson (1954; 1956) and Gagné (1968). Ferguson proposed his 'limits of learning' theory in an attempt to reconcile ability-factors with learning, and consequently environmental experiences. He regarded abilities as prior 'overlearned acquisitions' that have reached relative stability. His theory draws upon the principle of transfer of learning to account for the emergence of ability-factors. Through the mechanism of positive transfer, the learning of one intellectual task enhances the learning of other similar tasks. Consequently, these related tasks would be positively correlated as have been observed for various classes of related tests of intellectual abilities, such as tests of various aspects of verbal reasoning and others. Ferguson's concept of the relationship between ability-level

and the differentiation of abilities, as contained in this statement,

> "As the learning of a particular task continues, the ability to perform it becomes gradually differentiated from, although not necessarily independent of other abilities which facilitate this differentiation"
> (1954; p. 110)

implies the existence of a hierarchical ordering of abilities (Messick, 1972; p. 361). Furthermore, implicit in this statement is also the notion that the level of ability determines the extent of differentiation among abilities. In other words, given a number of similar tasks, a more differentiated pattern of abilities would emerge for groups of individuals who have attained a higher mastery level than for those at a lower level.

Ferguson further emphasized that abilities are the interactive product of an individual's biological propensities and cultural preferences for certain kinds of learning at particular age levels. This accounts for the emergence of different patterns of abilities among people of diverse cultural backgrounds as well as the variations in factorial loadings of the same test used in different environmental settings.

Gagné (1968) contended that mental ability entails a cumulative process, during which skills of increasing complexity are progressively built upon earlier-learnt simpler ones. These various skills form a transfer hierarchy, ranging from simple stimulus-response connections through chains (motor and verbal), multiple discriminations, concepts, and simple rules to complex rules at the peak of the hierarchy. This

transfer hierarchy of Gagné's can be viewed as an analog to a hierarchy of ability-factors. It follows from this standpoint that cultural preferences prescribe what should be learnt at particular levels, and that the nature of this hierarchy would vary across cultural groups.

Conceptualization of factor formation as cumulative learning is also supported by a number of other writers. Carroll (1966) attributed the formation of factors to a number of possible causes, amongst which are prerequisite learning, transfer of learning and co-occurrences of experiences under the aegis of the home, the school and the community. Horn (1967, 1968) described ability-factors as compounds resulting from the welding of anlage functions, aids, and concepts. These three skills form a hierarchy of increasing complexity in the direction of anlage functions, aids and concepts. The acquisition of the two more complex skills of aids and concepts also involves accretion of learning. Not denigrating the role of positive transfer, Horn maintained that avoidance-learning can also bring about intercorrelations among tasks for which no transfer effect exists. He explicated (1967) how both positive transfer of learning and avoidance-learning can operate within the school system to influence the development of abilities. That Vernon shared similar views with Horn is shown in this statement of his,

> "...much of the phenomena on mental growth and decline can be explained in terms of transfer and motivation." (1969; p. 81)

Both Horn and Vernon take the stand that effective schooling has a bearing on the formation of abilities.

The relation between ability-factors and environmental circumstances identified through factor analysis also finds support in the recognition of environmental circumstances in the Piagetian system of approach to the development of cognitive abilities (Vernon, 1965; Anastasi, 1970; Messick, 1972).

It is evident from the above discussions that there is considerable theoretical convergence (factorial, learning, and developmental) on the important role of experiential differences in influencing the development of, and organization of abilities. However, this theoretical consideration provides no elucidation on what constitutes favourable environmental conditions or what cultural characteristics favour the formation of what types of abilities. It follows therefore that the identification of environmental conditions associated with the emergence of ability-factors will have to be approached empirically.

Environmental Experiences and Stability of Ability-factors

Studies on the patterning of abilities of groups distinguished by 'specific' environmental characteristics appear to substantiate the theoretical viewpoint that the differentiation of abilities is bound up with the relevant experiences the child encounters in the course of development. Some of these experiences have been found to relate to schooling, some to familial psychosocial circumstances, and others to ecological characteristics in the environment at large.

Filella (1960) demonstrated how different ability-factors can emerge from the same battery of tests as a result of educational and socioeconomic differences. He administered a battery of six tests,

adapted for Colombian use from the Differential Aptitude Test Battery, to high school boys in Colombia, South America. Two groups differing in educational experiences were drawn from the Technical High School boys and Academic High School boys separately, while the two socio-economic level groups were drawn from the private and public high school boys who followed a common curriculum but differed on socio-economic levels. Though two factors were identified in both the patterns of the Technical High School and Academic High School groups, the nature of these two factors defined by tests yielding high loadings, differed among the groups. In the former group pattern, the two factors were best described as quantitative reasoning and spatial-mechanical reasoning while in the latter group, they were best described as verbal and non-verbal. Socioeconomic-comparisons on the ability patterns revealed that the high socioeconomic level group exhibited a sharper differentiation between verbal and non-verbal factors, and the nature of these factors also differed among the groups. In the high socioeconomic group (represented by the private high schools) the verbal factor was a broad academic factor resembling Vernon's v:ed while the non-verbal factor was considered a non-verbal reasoning factor having numerical, mechanical and spatial components. In the low socioeconomic group (represented by the public high schools) the verbal factor was defined strictly by verbal tests while the non-verbal factor was identified as a mechanical-spatial factor, resembling Vernon's k:m factor.

Similar cross-socioeconomic-class and cross-school-curricular comparisons of ability patterning were made by Dockrell (1966) with English school children from primary schools, and Grammar (Academic),

Technical, and Modern (General) secondary schools. Starting from the theoretical position of Ferguson (1954) and Vernon (1961), he hypothesized certain differences in the differentiation and nature of abilities to be associated with socioeconomic and school curricular variants. A battery of tests, sampling verbal and non-verbal aptitudes, linguistic and numerical skills, and practical and spatial abilities was administered to 10-, 12-, and 14-year -old school children classified as middle or lower social class groups on the basis of their fathers' occupations. Within each social class group of 12- and 14-year-olds were also subgroups distinguished by Academic, Technical, and General type of education. Cross-social-group comparisons of ability patterning results confirmed Dockrell's original hypothesis that middle-class groups would exhibit a greater degree of differentiation of abilities than the lower class group. Comparisons among the patterns pertaining to different type of schools for the 12- and 14-year old pupils revealed sharper differentiation in abilities for the Academic and Technical types than for the General type.

Vernon (1969) found evidence of schooling and cultural effects in the differentiation of abilities among the English, Hebridean, Jamaican, Ugandan, and Canadian Indians and Eskimos which he tested with his extensive and diversive battery of individual and group tests. Though there were generally cross-cultural similarities in the main ability-factors underlying his battery of tests for the English, Eskimo and Canadian Indian groups, there were some significant variations in the Hebridean, Jamaican and Ugandan groups. For example, in the Hebridean and Jamaican patterns, the g factor appeared to fuse with the

v:ed factor, giving rise to a g:v factor which also loaded on non-educational tests. This indicated that the verbal, reasoning, and perceptual abilities for these groups were less clearly differentiated. In the light of this g:v factor's correlation with environmental characteristics, Vernon interpreted it to reflect 'modern sophistication and cultural stimulus vs traditional and restricted' way of life for the Hebridean group, and the role of schooling for the Jamaican group. In the Ugandan group no g factor was identified, but there emerged a distinct v:ed factor with negligible loadings on Matrices, Draw-a-Man and Koh's tests. This factor was interpreted as highlighting the heavy reliance of school-achievement on the specialized ability to acquire the English language in the case of the Ugandan pupils.

Another extensive cross-cultural investigation was carried out by Irvine (1969) with Elementary and Secondary High School pupils in Kenya, Zambia, and Rhodesia. Irvine employed group tests sampling verbal, numerical, spatial, mechanical and perceptual tasks. Cross-ethnic similarity occurred with broad factors which Irvine interpreted as closely allied to the drill skills which were necessary for school success for the samples he used. Thus, the greatest cross-ethnic consistency was found with overlearned drill skills such as language usage, and mechanics of Arithmetic, while least consistency occurred with abilities like perceptual and reasoning skills which are more dependent on culturally diverse learning outside of school.

In his cross-cultural studies on the patterning of abilities with reference to Central Canadian Inuit , Nsenga Zambians, Northwest Green-

land Eskimos, and Alberta Whites, MacArthur (1973a; 1973b; 1974a; 1974b) obtained findings which appeared to jibe with those obtained by Vernon. Using another extensive and diversive battery of tests, though a variant of Vernon's, MacArthur obtained a relatively consistent pattern of three first-order broad oblique factors underlying his battery of tests for all the groups he tested. These three factors, identified by him as verbal-educational (v:ed), spatial-field-independence (k:m) and inductive reasoning (i) are similar to the three main ability-factors of verbal-educational (v:ed), spatial-perceptual-practical (k:m) and general reasoning (g), Vernon obtained with his battery of tests and groups of subjects.

In spite of the relative consistency of the three factors, MacArthur (1974b) observed notable ethnic differences in patterning, caused by some merging or splitting within this framework of three factors. Thus, though his Eskimo, Inuit and Alberta White samples generally exhibited the three identified factors in their patterning, in the Nsenga Zambian pattern, the v:ed and i factors merged into one factor. This Nsenga feature resembles the same feature Vernon had found in his Jamaican and Ugandan groups. Likewise, the findings on the Eskimos and Canadian Indians corroborated Vernon's findings on similar indigenous groups in Canada.

MacArthur (1974a) also compared the relative strengths of his groups on the three consistent ability-factors (assessed through their main marker tests) and noted that the abilities least affected by Native-White background differences were those involving inductive

reasoning from non-verbal stimuli, while those most affected pertained to the verbal-educational factor. In addition, the non-verbal abilities of the Indians and Eskimos were not restricted to concrete operations but involved abstract symbolic representations. MacArthur attributed the strengths of Canadian Indians and Eskimos on the non-verbal abilities to ecological and child upbringing 'factors'.

It would appear from the findings of Vernon, Irvine and MacArthur, that with non-Euro-American cultural groups, abilities associated with the verbal-educational factor tended to tie up with the particular ability of learning the English language, the verbal medium through which these abilities were assessed.

Investigations into the cross-cultural generality of the more elemental primary abilities have also received considerable attention. Vandenberg (1967) examined the cross-cultural generality of the Thurstone PMAs with Chinese college students in America and Spanish speaking South American college students. Administering a large battery of PMA tests in English and the native language of the respective groups, Vandenberg identified seven similar factors among the two groups. These were identified as Native language ability, Verbal ability, Memory, Spatial, Reasoning, Perceptual Speed and Number ability.

El Abd (1970) administered a battery of 14 tests, covering the primary abilities of Flexibility of Closure, Speed of Closure, Number Facility, Word Fluency, Verbal Comprehension, Spatial Orientation, and Perceptual Speed to two samples of African students - Higher School Certificate boys and male University undergraduates. The cross-group

factorial patterns turned out to be similar and though Al Abd used the Guilford Structure of Intellect model to label these equivalent factors, in terms of the traditional PMA terminology, the seven interpretable factors resembled the input ability-factors.

The consistent findings on the relatively stable PMAs, obtained by Vandenberg and El Abd were corroborated by findings from a study on younger subjects. Flores and Evans (1972) carried out a comparative factorial study on two Canadian and two Filipino samples of Grade 6 and Grade 8 boys. A battery of 18 tests, consisting of the Raven Progressive Matrices test, and selected tests from Thurstone's PMA battery and the FEP kit of reference tests for cognitive factors, was chosen to define these primary abilities of Word Fluency, Spatial Facility, Perceptual Speed, Arithmetic, Numerical Facility, Reasoning and Associative Memory. It was found that the resulting factor patterns for all four samples generally had similar factors, though a slight variation in composition of tests existed among the factors for different groups. Though the hierarchical factoring procedure was used, the nature of the factors which emerged for all groups resembled the PMAs of Verbal Comprehension, Numerical Facility, Spatial Facility, Associative Memory, and Induction.

A more comprehensive check on the reproducibility of primary abilities was carried out recently by Hakstian and Cattell (1974). They administered a large battery of 57 tests covering a comprehensive range of identified primary abilities to 347 young adult residents of Edmonton and its vicinity. By a careful selection of 3 marker tests per

factor they were able to reproduce their predicted input primary abilities. These were identified as Verbal Comprehension (V), Induction (I), Spatial Orientation (S), Perceptual (Clerical) Speed (P), Flexibility of Closure (Cf), Speed of Closure (Cs), Span Memory (Ms), Meaningful Memory (Mm), Associative Memory (Ma), Mechanical Knowledge (Mk), Aiming (A), Ideational Fluency (Fi), Word Fluency (Fw), Originality (O), Divergent Production of Semantic Classes (DMC), Spelling (Sp), Esthetic Judgment (E), and Representational Drawing (Rd). It has yet to be demonstrated whether this whole collection of primaries may be reproduced with other groups of subjects, but the reproducibility of some of the primaries does reaffirm Royce's contention (1973) concerning their invariance.

In summing up, the studies cited in this section have shown that ability-factors underlying the same battery of tests may vary across different cultural groups. Within the same culture, subgroups distinguished by differences in specialized training or socioeconomic standing may also exhibit different ability-factors underlying the same battery of tests. For subjects who are non-native speakers of English, the ability-factors underlying tests with high verbal contents may be clouded by the specific ability of learning the English language. The elementary common ability-factors (Horn, 1972) appear to be relatively stable among Euro-American subjects and subjects of other cultural groups who have been exposed to Euro-American educational treatments, and acculturation. In this respect, they provide a potential source of common abilities for use in comparative studies on the relation of

familial psychosocial circumstances to abilities. From the standpoint of cumulative learning theory, they should also be the more important abilities to be considered, since they represent the elementary processes upon which more complex skills develop.

Familial Psychosocial Circumstances and Ability-factors

Most of the earlier studies on the relation of familial psychosocial circumstances to ability-factors tended to identify status variables of the home, such as material possessions, parental occupation, family income, family size and structure, or more global indices such as social class, and examine how these related to gross measures of intelligent behaviour, such as IQ scores. Typical instruments sampling this type of home variables have been covered by Mosychuk (1969) in his review of literature.

Later studies however, have demonstrated a more comprehensive sampling of familial psychosocial variables to include additional variables which characterized the more dynamic aspects of the home environment or in Bloom's terminology (Bloom, 1964), environmental processes. One such study was carried out in Aberdeen by Fraser (1959) on a representative sample of 408, 12-year-old secondary pupils. Data on the material, cultural, motivational, and emotional aspects of the home were obtained by interviews. Each of the home variables measured - Parents' education rating, General book reading in home, Newspaper and magazine reading, Income, Family size, Living space, Occupation, Abnormal or broken home, Parents' educational and vocational aspirations, Parental encouragement, General family atmosphere, and Mother at work -

were correlated with general intelligence scores and a measure of school-achievement. The significant correlations obtained, ranged between .28 to .66, but of these, the highest value occurred with the variable, 'Parental Encouragement' for both cognitive measures. Only one variable exhibited non-significant correlational relationship with both IQ and school-achievement, namely, the 'Mother at work' variable. Another noteworthy feature shown in the correlational findings is that all variables appeared to have higher correlations with school-achievement than with IQ.

Another noteworthy study on the relationship between home environment and test performance was conducted by Douglas (1964) in Britain. He examined the home conditions of 5000 children born within the first week of March, 1946, during infancy, 8 years and 11 years of age. The home variables studied covered housing conditions, family size, paternal and maternal education and social class, parents' interests and aspirations, and parental encouragement and educational ambition for the child. The cognitive measures included intelligence, English and Arithmetic tests, and 11+ selection results. Analyses were carried out to examine the effects that differences on each of the home variables would have on average test scores at age 8 and 11 years. It was found that generally, parental encouragement and educational ambition for the child exhibited greatest influence, though overcrowding, unsatisfactory housing conditions and family size were also relevant 'factors'. Furthermore these variables exhibited cumulative effects during the 8-11 period. It was also noted that some variables appeared to operate

differently in different social class. For example, children from middle-class homes were less influenced by their parents' attitudes than were children from working-class homes.

The phenomenon that home conditions may operate differently in different social classes in Britain as observed by Douglas, was corroborated by findings from a study by Swift (1967). Swift investigated the association between family environment and 11+ success in an attempt to identify some familial predictors for 11+ success. He defined his family environment in terms of these variables - economic characteristic, family structure, occupational status, and parental educational experience and attitudes. The economic characteristic variable was assessed by a material index computed by giving a score of 1 to house-ownership, car-ownership, father's weekly take-home pay if more than thirteen pounds, and rooms-persons ratio of the family more than 1. The findings revealed that father's occupation had a stronger link with 11+ success than mother's occupation before marriage; parental education was related to 11+ success for working class families but appeared to be of less importance for middle class families. Social class membership also had an effect on the relation between 'Material Index' and 'Parental Attitudes to School' and 11+ success. Thus 'Material Index' was found to have significant association with 11+ success, but when the sample was broken down into middle-class and working-class subgroups, no significant relationship existed for the middle-class group. Also, working-class families who saw clearly the link between education and economic success tended to have successful children, but

this was less so in the middle-class group.

In each of the ethnic samples Vernon had tested (op cit), he correlated each of the emergent ability-factors with home background data which he collected from interviews. From his results over all the cultural groups, it may be inferred that generally, the verbal abilities were highly associated with home variables, such as 'Cultural Stimulus', 'Linguistic Background', and 'Planfulness in the Home'; while non-verbal abilities, more specifically spatial-perceptual abilities were either associated with Masculine Dominance in the home and Encouragement of Initiative, or not correlated with any home environmental variables. The relationship of Socioeconomic Status to abilities was not very clear-cut, but when it was associated with any ability it tended to exhibit a moderate correlation. A striking feature which emerged at the cross-cultural level was that there was evidence of the home environmental variables relating differently to abilities in different cultural groups. For example, in the Eskimo group, the g factor did not correlate with Socioeconomic Status, Cultural Stimulus nor Planfulness in the Home and in the Ugandan group, Socioeconomic Status was most highly correlated with the verbal ability-factor.

Pioneered by Wolf and his colleagues at Chicage (1964b), a series of studies had been conducted to demonstrate that relative to status variables, process variables of the home were more closely linked to abilities. The Chicago technology of measurement conceptualized the total home environment surrounding an individual as being composed of a complex system of subenvironments, each of which is related to the

development of a 'specific' characteristic. Furthermore for any individual characteristic, a subenvironment that is likely to affect its development can be identified and assessed through behavioural characteristics.

Thus, Wolf (1964a) adopted the above methodology in studying the link between home environmental circumstances and general intelligence as assessed through the Henmon-Nelson Test of Mental Ability. Wolf's subenvironment consisted of three press variables - Press for School-achievement Motivation, Press for Language Development, and Provisions for General Learning. These three process variables taken together resembled Vernon's 'Cultural Stimulus' and 'Linguistic Background' variables. Wolf developed an interview schedule to collect the data from the mother of each of his child subjects. The total score on these three variables was found to correlate .69 with the intelligence measure. The status variables sampled for investigation were father's occupation, a combined rating of parent education, and an index of social class representing a weighted combination of ratings of occupation, source of income, type of house and dwelling area. It was found that the process variables gave a multiple correlation of .76 with the intelligence measure, in contrast to .40 for the status variables with intelligence.

Dave (1963) had applied the same methodology to measure the educational environment of the home he hypothesized would bear a relationship with school-achievement. The total scores on his six process variables (Achievement Press, Language Models, Academic Guidance,

Activeness of the Family, Intellectuality in the Home, and Work Habits in the Family) when correlated with school-achievement (measured by the IOWA Test of Basic Skills) gave a correlation of .80, as against .02 for the combined scores on the status variables (similar to those used in Wolf's study) with school-achievement. Dave's study was replicated on Trinidad elementary school children by Dyer (1967) and much the same result was obtained. Plowden et al (1967) also found somewhat similar results in favour of a stronger link between process variables and reading ability. Of the process variables (Aspirations for the Child, Literacy of the Home, Parental Interest in Schoolwork) and status variables (Father's education, Mother's education, Father's occupational group, Number of dependent children, Physical activities of the home), examined in relation to reading ability, they found that the former variables contributed more substantially to reading ability.

Following along the lines of the Chicago school of investigation, Marjoribanks (1970) investigated the relative relationship between process variables, and status variables, to four well-established Thurstone's PMAs of Verbal, Number, Reasoning, and Spatial abilities. The subjects under study were Grade 5 boys sampled from five Canadian ethnic groups. Focusing on those process variables which previous research findings (Vernon, op cit; Bing, 1963; Ferguson & Maccoby, 1966; Witkin et al, 1962) had shown to relate to his four abilities of interest, he selected eight process variables for investigation, namely, Press for School-achievement, Press for Activeness, Press for Intellectuality, Press for Independence, Press for English, Press for Ethlan-

guage, Father's Dominance and Mother's Dominance. Six standard status variables - Education of Father, Education of Mother, Occupation of Father, Number of Children in Family, Crowding Ratio, and Ordinal Position in Family, were selected for testing his hypothesis that process variables would contribute more substantially to the variation in scores on the ability tasks than the status variables. The findings confirmed this hypothesis.

Several other studies concerned primarily with familial process variables in their investigations on the link between home environmental circumstances and abilities. Drawing upon the process variables which previous researchers had underpinned as indicative of being more specifically linked to the differential abilities in the WISC battery, Mosychuk (1969) developed a Differential Environmental Process Variable Scale consisting of 10 process variables to examine the extent of their relationships to the WISC component abilities. The 'patterns' of his findings reiterated the trends in previous findings that:

1) Verbal abilities were highly correlated with Parental Academic and Vocational Aspirations, Parents' Knowledge of, and Interest in Child's Educational Development, Linguistic Background, Learning Materials in the Home, and a Secure, Planful, Purposeful Home;

2) Numerical and Reasoning abilities were linked with home exposure to rich and variegated visual and kinaesthetic stimuli, and encouragement of resourcefulness and initiative;

3) Spatial and Perceptual abilities correlated negatively with Female Dominance in upbringing.

Garber and Ware (1970) described the development of an instrument called the 'Home Environment Review' (HER), which was designed to serve two functions. The first being to examine the home characteristics which would be manipulable by educators and the second to measure variables which they considered to be more directly linked with school-achievement. The HER variables included: 1) Expectations for Child's Schooling, 2) Awareness of Child's Development, 3) Rewards for Intellectual Development, 4) Press for Language Development, 5) Availability and Use of Supplies for Language Development, 6) Learning Opportunities Outside the Home, 7) Materials for Learning in the Home, 8) Reading Press, and 9) Trust in School. Using stepwise multiple regression analysis on the nine HER components as predictors and scores on the Peabody Picture Vocabulary Test as criterion, Garber and Ware found that the two HER components which had significant bearing on the intelligence criterion were 'Expectations for the Child's School Success' and 'Learning Materials in the Home'.

Jones (1972) selected only those of Mosychuk's DEPVAR variables that gave evidence of a more definitive relationship with verbal ability and combined these with Bernstein's Mother Interaction Index in her measure of the home environment. She compared these home indices (Interaction Index, Toys Index, Communication Index, Academic and Vocational Aspiration, Knowledge of Child's Academic Development and Material Opportunities for Language Development) for two samples of Grade 5 Canadian boys who represented the two extremities of the verbal continuum in a group tested on the WISC verbal ability tests. Her t-test

results on the significant cross-group differences in means for each of the home indices showed that high verbal scorers came from homes where parents had a higher verbal interaction index, high academic and vocational aspirations for the child, and had provided more opportunities for the development of language. High verbal scorers also had high occupational status. A stepwise regression analysis on the pooled sample brought out the variable, 'Opportunities for the use and development of language' as the best predictor of verbal ability.

As had been alluded to in the preceding chapter, the affective interpersonal variables associated with familial socialization processes have relevance to cognitive development in that they affect the child's inclinations to explore the environment and his reactions to stimulating experiences. The link between affective variables and abilities have been observed through child-rearing studies.

Findings seem to indicate that certain types of familial affectional relations, patterns of upbringing and types of home discipline are more favourable to the development of some abilities than others. Thus, the studies of Hurley (1965), Crites and Sembler (1967), and Bayley (1968) have shown that a home which promotes the child's feelings of worth, sense of belonging and self-reliance leads to better performance in widely-used tests of intelligence and school-achievement. Parent-child sharing and social interaction were found to relate to mental abilities in the studies of Hill (1967), and Pedersen and Wender (1968). Honzik (1967) reported that certain affectional relations within the family such as mother-son closeness and father's friendli-

ness towards daughters correlated with longitudinal change in intelligence scores. Bayley (1971) reported that school-age children with loving mothers tended to score highly on intelligence tests while their counterparts who had hostile rejecting mothers obtained considerably lower scores. Radin (1972) found significant correlations between maternal warmth and initial IQ and IQ gain in preschool, in his sample of lower-class preschool children.

Patterns of child-rearing practices and parental characteristics have also been shown to relate to differential abilities. Kent and Davis (1957) investigated the relationship between scores on Stanford-Binet IQ, and WISC Performance IQ and types of home discipline in a study of 118, 8-year-old English children. It may be deduced from their findings that children of demanding and over-anxious mothers scored better on Verbal IQ than on WISC performance.

Witkin et al (1962) in their attempts to uncover the antecedents of the field-dependence-independence dimension of psychological differentiation, a mode of intellectual or perceptual functioning characterized by an analytical way of perceiving stimuli, discovered that authoritarian mothers who imposed severe standards of discipline, and stressed conformity negate differentiation but might foster the development of verbal abilities. The field-dependence-independence dimension may be assessed through the Embedded Figures Test (EFT), a test which often loads on the Flexibility of Closure primary ability-factor (Horn, 1972; p. 466).

In their series of studies on mother-child interactions (Witkin

et al, 1962; Dyk & Witkin, 1965; Witkin, 1967) they had managed to uncover patterns of child-rearing practices which relate to the field dependence-independence dimension. Three major parameters with their corresponding indicators interpreted as facilitating differentiation were: 1) Training for Independence as exhibited by mother's adoption of physical care appropriate to child's age, mother encouraging child to assume adequate responsibilities and activities, and mother stimulating child's curiosity and interests; 2) Training for Control of Aggressive, Assertive Behaviour as indicated by mother using reasoning and explanation in disciplining, and maternal consistency in behaviour; and 3) Mother's Personal Characteristics as indicated by having assurance in her own competence in raising the child (Witkin et al, 1967; p. 237).

In summing, the familial psychosocial variables which have been investigated in terms of their links with abilities, may be classified into three broad categories of affective, process, and status variables. The abilities examined were usually omnibus tests of intelligence, such as the WISC, Lorge-Thorndike, Stanford Binet, or Thurstone's four extensively-used PMAs of Verbal, Number, Reasoning, and Spatial, or school-achievement. The only study using factor-analytic ability-factors was Vernon's, though an attempt was made at it in Mosychuk's study. Short of the factor-analytic criterion of an ability-factor, the abilities examined in the studies cited in this section may be viewed broadly as verbal abilities, non-verbal abilities and school-achievement.

Consistencies in findings across studies show that there is a clear link between the verbal abilities and these familial psychosocial variables as 'Occurrence of parent-child verbal interaction', 'Provisions of opportunities for language development', 'Parental educational and occupational status', 'Authoritarian mothers', 'Dependency-fostering and overprotection' and 'Maternal warmth and love', and "Learning materials in the home'. Non-verbal abilities, as represented by spatial, perceptual abilities, tended to relate to 'Exposure to rich and variegated visual and kinaesthetic experiences', 'Self-reliance', 'Encouragement of initiative and resourcefulness', 'Adult models' and 'Planfulness in the home, and 'Maternal justification of discipline'. Furthermore there is evidence that non-verbal abilities as characterized by Spatial and Perceptual abilities, have a weaker association with familial psychosocial circumstances. School-achievement related generally to 'Parental educational and occupational status', 'Material wealth', 'Maternal warmth and love', and the whole array of process variables which had originated from the Chicago technology of environmental measurement.

Summary

The preceding review presents the theoretical basis for, and findings to date on the relation of familial psychosocial circumstances to mental abilities.

Theory substantiated by research findings has demonstrated the fruitful results of identifying dimensions underlying mental tests, namely, ability-factors. This process of dimension-identification has

led to meaningful psychological descriptions of clusters of cognitive tasks and their links with developmental 'factors' such as learning and environmental circumstances.

Different factoring procedures can bring out different models of viewing the clustering of tests, but the hierarchical model has been shown to have conceptual links with learning principles and developmental theories of cognition. Currently, the hierarchical model is a more preferred model for viewing abilities. There is a general consensus among psychometrists on the possible causes for the emergence of factor-analytic abilities. The generally accepted causes are prerequisite learning, transfer of training, and cultural and educational experiences.

Though there is considerable theoretical convergence on the important role of experiential differences in influencing the development of abilities, this theoretical consideration provides no elucidation on what constitutes favourable environmental conditions or what environmental characteristics favour the formation of what types of abilities. It follows therefore that identification of environmental conditions associated with the emergence of ability-factors will have to be approached empirically. Cumulative learning models of abilities coupled with the fact that the home is the child's first encounter with the environment makes it logical for attention to be given to home environmental experiences.

Studies on group differences in ability patterning both among subgroups within Euro-American cultures and among cross-cultural groups

have shown that ability-factors underlying the same battery of tests may vary across groups differing in environmental experiences, such as schooling, socioeconomic status, cultural and ecological backgrounds. On the other hand, the elementary common ability-factors appear to be relatively stable among school subjects both within Euro-American cultures and across diverse cultures. An important feature brought out in cross-group comparisons of ability patterning is that the same test may not be measuring the same ability-factor in different groups.

Most of the studies examining the association between abilities and familial psychosocial circumstances used omnibus tests of intelligence or subscales from batteries of general intelligence, and tests of school-achievement. With the exception of Vernon's isolated attempt to adhere to the factor-analytic concept of abilities, the majority of studies used either single test scores or composite scores on a group of tests as ability measures. This gives rise to a missing link in the empirical relation of familial psychosocial circumstances to abilities conceived in factor-analytic terms, and presents a weak basis for clear-cut generalizations on the relation of abilities to familial psychosocial circumstances.

The familial psychosocial variables studied, generally fell into three broad categories of affective, process, and status variables. Though variations occurred across studies in the naming of these variables within categories, examination of specific behavioural characteristics defining the variables showed that the frequently studied variables within each category were:

Affective variables: Maternal warmth and love, parent-child closeness and social interactions, female dominance in child upbringing, and types of home discipline.

Process variables: Press for school-achievement, activeness in family, intellectuality in the home, availability of a variety of learning materials, model identification, occurrence of parent-child verbal interaction of an informative nature, self-reliance, exposure to rich and variegated visual and kinaesthetic experiences and planfulness in the home.

Status variables: Material possessions in the home, parental education and occupation, linguistic background, family size, family income, family structure, and dwelling-place.

Several general consistencies among findings have emerged. Generally, the familial psychosocial variables listed above had been shown to exhibit varying degrees of association with one ability or another. The trends in the findings point to a differential relationship between familial psychosocial circumstances and abilities. Thus, verbal abilities relate substantially to variables, such as "High degree of parent-child verbal interaction', 'Parental aspirations for child's education', 'Provisions of opportunities for language development', 'Parental educational and occupational status', 'Authoritarian mothers', 'Dependency-fostering and overprotection', and 'Maternal warmth and love'. Non-verbal abilities, as represented by Spatial, Perceptual and Numerical abilities tended to relate to 'Planfulness in the home', 'Exposure to rich and variegated visual and kinaesthetic experiences',

'Self-reliance', 'Adult models', and 'Encouragement of resourcefulness and initiative'. Finally, school-achievement has been found to relate to the same familial psychosocial variables in much the same way as the verbal abilities. Where comparisons had been made within studies, findings usually point to a stronger link for process variables to abilities, than for status to abilities. However, most of these findings occurred in studies on Euro-American children in the preschool or early school periods, for whom the home and school mutually reinforce each other in fostering these abilities.

In conclusion, there is theoretical justification for the study of the relations of familial psychosocial circumstances to ability-factors. Investigations into the relations of familial psychosocial circumstances to ability-factors have delineated groups of familial psychosocial variables which are consistently linked to certain loosely-defined ability-factors. Though psychometrists have often underscored the part played by schooling in fostering ability-factors other than g, studies to date have given little consideration to the role of varying interplay between the home and school.

In the light of what has emerged from the preceding review, this study attempts to establish some elementary common ability-factors across the Chinese and Malay groups in Singapore, and to examine how these abilities relate to familial psychosocial circumstances which have been identified as important correlates of similar abilities for Euro-American subjects.

## CHAPTER III

## DEFINITIONS, THEORETICAL RATIONALE, AND HYPOTHESES

### Definitions

The following definitions of terms are presented to indicate their specific connotations within the context of this study.

Affective variables refer to the emotive-experiential accompaniments of parent-child interactional processes that are likely to affect the child's inclinations to explore the 'physical, interpersonal, and ideational aspects of the environment' (Hurley, 1965; p. 19), such as warmth, hostility and affection.

Process variables represent the more dynamic and purposeful interactions between parent and child that bear directly on the cognitive development of the latter, such as 'Parental Aspirations for Child's Education', 'Direct Teaching Activities', 'Educational Activities' and 'Encouragement for Activeness'.

Status variables represent the more tangible aspects of the home, such as family structure, or socioeconomic indicants like parental occupation, amount and quality of modern appliances, and other similar forms of material wealth.

Psychosocial variables refer to the generic term which subsumes the affective, process, and status variables.

Domain refers to a broad representative sample of variables - if the constituent variables are cognitive tests, then it is an ability domain, if the constituent variables comprise affective variables, then

it is an affective domain, and so on for the process and status variables.

Factor relates to a cluster of variables that emerges from a factor analysis of a domain of variables. Thus an ability-factor would be a cluster of cognitive tests resulting from the factoring of a domain of such tests, and an affective-factor would be a cluster of affective variables resulting from the factoring of an affective domain, and the same applies for process and status domains. The same term in quotation marks refers to common usage of the word. The word ability is also used synonymously with ability-factor.

Elementary abilities are first-order factors arising from the factoring of a domain of tests, and defined by two or more tests measuring the same specific skill (Horn, 1975). They represent the elementary common factors described by Horn (Horn, 1972; p. 498).

Culture refers to the anthropological concept of the term - the social mores, values and attitudes, and 'patterns' of interpersonal behaviours as practised by a group of individuals.

## Theoretical Rationale

Studies on group differences in patterning of abilities have shown that the same test may not measure the same ability-factor. Ability-factors underlying the same battery of tests may vary across groups differing in environmental experiences, such as schooling, socioeconomic status, and cultural and ecological backgrounds. With school subjects, the stability of the elementary common ability-factors (Horn, 1972; p. 498) have been relatively established both within Euro-American

cultures and across other cultural milieus.

Taking cognizance of the above features of tests and ability-factors, this study is organized in terms of two purposes:

1. a) to investigate the patterns in a domain of school-related ability-factors across two samples of Singapore Chinese and Malay 14-year-old male pupils and b), c), d) to similarly examine factor patterns in affective, process, and status domains of familial circumstances; and
2. to examine the relation of the ability-factors to familial psychosocial circumstances with particular reference to those which have been consistently identified as important correlates of the abilities in Euro-American context.

The main aim underlying purpose 2 is to test the generalizability of Euro-American trends in findings on the relation of familial psychosocial circumstances to abilities, to other cultural groups for whom the interplay between the home and school in fostering these abilities varies from Euro-American cultures.

Some of the studies cited in the foregoing review (Filella, 1960; Dockrell, 1966; Vernon, 1969), and the arguments presented in Chapter I suggest that differences in schooling, social class membership and varying interplay between the home and school may result in various 'patterns' of relationships between familial psychosocial circumstances and abilities. To ascertain that group differences on the relation of familial psychosocial circumstances to abilities reflect only variations due to interplay between the home and school, the subjects for

this study were drawn from the Singapore Chinese and Malay pupils with similar educational exposure and socioeconomic class. Variations in the interplay between the home and school for these groups exist along the following directions. Members of both groups differ from Euro-American subjects in that for them schooling plays a compensatory role, while for Euro-American subjects schooling plays a reinforcing role. Among the Chinese and Malay samples, variation occurs to the extent that schooling effects can offset the effects of the home in that the Chinese pupil would tend to respond more positively to schooling because of traditional respect for intellectual strivings, the Chinese habits of persistence in work, and strong motivation, while the Malay pupil with his easy going outlook on life in general may be indifferent to schooling (Hunter, 1966; Wilson, 1967). This difference between the two groups in their response to schooling is reflected in the fact that in spite of equal educational facilities and opportunities, the Chinese subjects appear to be better school-achievers.

In keeping with the first purpose of this study an ability domain is to be conceived of as a broad representative sample of abilities comprising the more stable elementary common ability-factors (Royce, 1973; p. 314) and which are closely associated with measures of intelligence (Horn, 1972; p.483) and the three most important subjects in the Singapore school curriculum, namely, Reading, Mathematics and Science. Consistent findings on the stability of elementary common ability-factors (Hakstian & Cattell, 1974; Horn, 1975) indicate that the composition of such an ability domain could be reproduced from an input

battery of carefully selected tests. Thus the input elementary ability-factors for this study represent the Verbal Reasoning, Induction, Number Facility, Space + Visualization, Flexibility of Closure, Speed of Closure, and School-achievement abilities.

Euro-American research has shown that abilities may relate to familial psychosocial circumstances in three domains characterized by affective, process, and status variables. However, the trend in findings has been in the direction of a stronger link between the process domain and abilities. Because the school also plays a part in fostering these abilities, it is possible that the relation of familial psychosocial circumstances to abilities would depend on the relative contribution of the home and the school in fashioning these abilities.

It is apparent that of the three domains of familial psychosocial variables, the process domain matches the teaching processes in school and hence are more susceptible to counter-balancing effects of schooling. Considered from this point of view, in cultures where schooling plays a dominant role in enhancing the development of these abilities, the link between the process domain and school-related ability-factors may not be as strong as has been demonstrated with Euro-American subjects for whom the home and the school are reinforcing institutions. Justification for the more probable stronger link between abilities and the status domain or affective domain, in cultures where schooling plays a compensatory role, has been alluded to in Chapter I.

In the light of the above discussions the factors underlying the selected ability, affective, process, and status domains, in this study

are to be investigated for the Chinese and Malay groups separately. The relations of the generated common ability-factors are then to be examined with reference to the factors underlying the affective, process, and status variables, which are being described under instrumentation.

Hypotheses

Within-ability Domain. The stability of elementary common ability factors have been well-established with Euro-American subjects and non-Euro-American subjects who have been exposed to comparable Euro-American educational treatment and acculturation. The Chinese and Malay samples in this study are of comparable social backgrounds and have been inducted into a uniform system of Euro-American evolved-type of schooling. It is likely that they will exhibit similar ability patterns and the nature of the ability-factors will be similar to the input ability-factors which have been selected on the basis of Euro-American definitional norms. To test the reproducibility of these Euro-American ability-factors in the Chinese and Malay ability patterns, the following hypothesis is proposed for examination.

1. The emergent first-order ability-factors in both the Chinese and Malay ability patterns will resemble the input elementary ability-factors.

The Chinese pupil because of his strong motivation to achieve school success and traditional habitual diligence, tends to stretch his school-achievement further to his capacities than would his more easy going Malay counterpart. In terms of Ferguson's theoretical viewpoint

on the differentiation of ability-factors, the School-achievement factor in the Chinese ability pattern will exhibit sharper differentiation from the other within-Chinese ability-factors than the Malay School-achievement factor will in the Malay ability pattern. To test this, the following hypothesis is presented for investigation.

2. The Chinese School-achievement factor will exhibit sharper differentiation from all the other ability-factors in the within-Chinese-pattern than the Malay School-achievement factor will in the within-Malay-pattern.

Within-psychosocial Domains. Many of the studies covered in this review have shown the tendency of some familial psychosocial variables to operate differently in different social groups because of differences in deep-seated social values and attitudes. It is likely that because of the Chinese and Malays' socio-cultural historical differences the same phenomenon may exist among the familial psychosocial variables across these two ethnic groups. To test whether this may be the case, the following hypothesis is proposed for study.

3. The variables within each of the three psychosocial domains will pattern differently in the Chinese and Malay samples. From the information available, however, there seems to be little basis on which to predict specifically how the patterns may differ.

Between Ability Domain and Each Psychosocial Domain. Relative to the status domain, the process domain has been consistently shown to

exhibit a stronger linkage with abilities in Euro-American setting. Arguments have been presented in the preceding discussions that for groups where schooling plays a relatively compensatory role in fashioning the abilities, the same characteristic of the process variables may not show out in the relation of familial psychosocial circumstances to abilities. To examine whether there is empirical validity for such arguments the following hypothesis is advanced.

4. Relative to the affective and status domains, the process domain will exhibit a stronger link with the Verbal Reasoning and School-achievement factors if hypothesis 1 holds.

# CHAPTER IV

## SAMPLES AND SAMPLING

### Samples

The two major ethnic groups in Singapore, of Chinese and Malay origins, having been brought under a uniform system of Euro-American-evolved type of schooling, served as subjects for this study.

Family structure and socialization 'patterns' as they pertain to these subjects differ considerably from Euro-American norms. Most Singapore families comprise, in addition to the Euro-American nuclear family, older relatives who contribute not only to the material wealth of the family but also provide some kind of compensatory or complementary parental functions which can balance out the inadequate parental care that would exist in large nuclear families. Furthermore, the eldest child or other older children very often have to share the parental responsibility of looking after the younger siblings while the youngest child is usually showered with all the brotherly and sisterly affection and encouragement in addition to those of the parents. Parents who come from the lower occupational status group themselves, may have some relatives or older children with considerably higher educational level and occupational status. Such members in the family may act as some sort of identity figure to the child and hence exert some influence on him. Thus, the Singapore Chinese or Malay child's 'pattern' of family-interactions is diffused and distributed among this wide circle of family members, unlike that of his Euro-American counter-

part, whose family-interactions tend to centre around the nuclear family unit.

Considerable differences existed in the ecology and culture of these two ethnic groups in pre-independent Singapore days. The Chinese by virtue of their more urban-centred occupations such as commerce, the professions and retail trades had an urban-oriented culture. Their values and habits were more urban-oriented than their Malay counterparts. The latter's common occupations were fishing, gardening, the police force and marine-related works, such as sailors or seamen. The nature of these occupations led the Malays to move to the 'rural' parts of Singapore or the neighbouring small islands. They lived in kampongs which consisted of clusters of varying numbers of wooden bungalow houses, where Malay families related through kinships lived. Most Malay social activities were transacted within each kampong community. The Malay child's vision of the world lay within the confines of this community. In this respect it is recognizable that the Malay child would tend to have a rural-oriented vista as against the city-oriented vista of his Chinese counterparts. Few Malay children attended formal schooling, the majority of them just received some religious instruction in Islam (the Malay religion) at a nearby religious school or at the residence of a guru (Malay term for a teacher) who usually resided within the same kampong.

Nearly every Malay is a Muslim (a believer in Islam). To the Malays, Islam and the study of it is an "integral part of the life and being of a Malay" (Wilson, 1967; p. 64). The daily lives of the Malays

are to a large extent sanctioned by the teachings of Islam. In contrast the Chinese takes an eclectic approach to life in general. Thus, the Chinese are not restricted to any religion and regardless of their religious orientations, their realization of the economic value of an English education during the colonial era had led them to avail themselves of the educational facilities provided by the Christian missions. In contrast, the strong hold of Islam on the Malays led them to stay away from formal schooling which they viewed as a threat to their religion because of its affinity to Christianity.

The character of child upbringing among these two ethnic groups presented another dimension of cultural contrast. Chinese children were brought up strictly to respect parental or adult control. The Chinese had very strong traditional family relationships. Within each family, younger siblings had to demonstrate some respect to older siblings by addressing them by their proper older sibling terms and not their personal names. Older siblings in turn are expected to protect their younger sibs and to yield to them in quarrels over playthings. In addition it was the responsibility of older sibs to set a good example for younger members of the family. At a very young age the child was made to understand that adult control is an expression of their concern for him and he should appreciate it. Within this strong system of control, the Chinese child imbibed Chinese traditional habits of frugality, persistence in work, and esteem for education from their adult exemplars through observation and imitation with very little verbalization. Interdependence among family members was very strong

and it was the responsibility of every family member to uphold the family image. Thus, a child whose parents or older siblings had achieved high educational or occupational status felt it his responsibility to maintain at least that family position and this motivated him to strive for his best in school.

While the 'patterns' of family relationships and socialization processes within Malay families may be somewhat similar to those in Chinese families, they vary in degrees of control. Malay parents on the average tended to adopt a more indulgent approach in the upbringing of their children. In addition the Malays valued the less demanding rural way of life and consequently had adopted a laissez-faire attitude to life. Because of this they were more inclined to adopt a rather indifferent attitude to education and this was reflected in the upbringing of their children.

When Singapore became self-governing in 1965, a new system of education was evolved, which aimed to provide every Singapore child, regardless of race or religion, with the necessary skills for articulation with the nation's developing industrialization programs, while at the same time enabling each ethnic group to preserve its distinctive cultural heritage. Thus, education in Singapore now is available in the four official languages of the Republic, namely, Mandarin (the traditional Chinese official language), English, Malay (also Singapore's national language), and Tamil (the most common Indian dialect in Singapore). All these four language streams of education follow a common curriculum. It is compulsory for every Singapore school child to have

two school languages, with English as the lingua franca though not necessarily the main medium of instruction. Parents have the option to select the medium of instruction for their child. For most Chinese pupils, the mother tongue is not any of the school languages because the home language is often one of a number of Chinese dialects, the spoken versions of which are incomprehensible to a speaker of Mandarin and vice versa. Most of the Malay pupils on the other hand, have one of the two school languages as their home language.

Educational and employment opportunities in general revolve around the merit criterion. The educational system has an in-built competitive structure and the selection of candidates for jobs is often linked to their performance at the educational level appropriate to the job requirement. This intimate link between educational-achievement and economic success makes education highly valued in Singapore. Apparently the realization of such a link would raise the aspiration and achievement motivation levels of the Chinese with their eclectic outlook on life, more than the Malays with their more laissez-faire orientation towards life. This is saliently described in the quotation,

> "...Chinese came from a society where education is esteemed and where the pressure of competition has been inordinately strong. They see clearly the link between formal education and personal economic success...and the habits of frugality, hard work and unquestioned parental control drive the Chinese pupil to the limits of his ability."
> (Hunter, 1966; p. 44)

Sampling

The English-stream Secondary II pupils (equivalent of grade 8-9), ages between 13+ and 14+, from the integrated school system of Singapore formed the population from which samples were drawn. This age group was chosen for the reasons that theory has indicated that children at this age level have well-differentiated abilities and the fact that within the structure of Singapore's educational system, pupils at this grade level are sufficiently heterogeneous on mental abilities. Added to these is also the fact that these subjects' English Language proficiency would reduce errors in test-taking situations using English as the medium of administration.

Four integrated secondary schools servicing the children in four different geographical locations on the island of Singapore were selected. This was to ascertain that the subjects drawn would be heterogeneous on the psychosocial variables under investigation. The list of participating schools appears in Appendix IV. The Chinese and Malay male pupils in the Secondary II English-stream classes in these four schools were tested. The original plan was to randomly sample 200 of these pupils from each ethnic group but this fiscal year's available numbers in this category of pupils in these four schools turned out to be less than this number. Since the available number of 147 for the Chinese and 190 for the Malays, each relative to the number of selected instruments used fell within the commonly accepted range of 2:1 to 5:1 for the ratio of number of subjects to number of tests for factorial studies (Cattell, 1966; p. 236-237), it was decided to use these avail-

able sample sizes for the two groups. Heavy time constraints and the need to arrive at a workable testing schedule with minimum disruption of important school lessons, did not permit the more ideal sampling alternatives. Table 1 shows the descriptive data of the two samples.

The restriction to male pupils was for these reasons: - 1) getting results that could be compared with Euro-American data, 2) to resolve the problem of interpretation on the uncertainty over sex differences in mental abilities as a result of new evidence found in recent studies carried out with non-Euro-American groups (MacArthur, 1974b), and 3) this guiding statement by Vernon,

> "Cause-effect relationships are on the whole more straightforward in the male sex. Girls seem to react more to the immediate social situation, hence it is more difficult to trace their present behaviour back to past experience." (1969; p. 8)

TABLE 1. DESCRIPTIVE DATA OF CHINESE AND MALAY SAMPLES

| Ethnic Group | Chinese | Malays |
|---|---|---|
| Number of Subjects | 147 | 190 |
| Sex | Male | Male |
| Type of School | Integrated | Integrated |
| Number of years in School | 7+ | 7+ |
| Mean Age | 13 yrs. 8 mths. | 13 yrs. 10 mths. |
| Raven Progressive Matrices Mean Score (S.D.) | 47.90 (5.11) | 41.51 (8.49) |
| Father's Occupation, Mean (S.D.) | 3.63 (1.33) | 3.20 (1.09) |
| Father's Education, Mean (S.D.) | 2.35 (0.83) | 2.39 (0.92) |
| Mother's Occupation, Mean (S.D.) | 1.21 (0.57) | 1.16 (0.55) |
| Mother's Education, Mean (S.D.) | 1.67 (0.92) | 1.46 (0.79) |
| Material Wealth, Mean (S.D.) | 3.89 (1.44) | 3.49 (1.21) |

## CHAPTER V

## INSTRUMENTATION AND PILOT TESTING

It was decided to collect data on the psychosocial variables from the subjects themselves in contrast to the usual method of getting information from the mothers. This was considered a legitimate way for the reason that essential consideration must be accorded to the vital role of the child's perspective because it is his interpretation of the attribution of intent that would have an impact on his cognition. An additional support for this approach was the subjects' capability to give reliable responses to the questions in the context of the mechanics of administration.

### Instrumentation

An abundance of empirical evidence existed for supporting the selection of valid familial psychosocial variables that are important for cognitive development in Euro-American settings, but there is scarcity of empirical reference materials in this domain for the cultural backgrounds of the subjects in this study. However, an examination of the conceptual rationale in Euro-American studies (cf test rationale, Schwarz & Krug, 1972) for the selection of important psychosocial variables in influencing particular abilities, showed that similar basic constructs of the kinds identified in Euro-American familial environments do prevail in the home environments of the subjects in this study.

For the purpose of investigating whether evidence of these Euro-American constructs in the home environments of the present subjects

would exhibit similar trends of relationship with school-related skills, the following psychosocial variables within each domain of affective, process, and status variables were selected.

Affective Domain. Research and theory in child development have indicated that parental behaviours (more commonly maternal) in child-rearing can arouse feelings in the child in a way that would influence his cognitive development, as has been discussed in the preceding review. An examination of the types of parental behaviours that have been studied in relation to abilities (e.g. those cited in the review) showed that these were generally compatible with the 18 discrete components of parental behaviour sampled in the revised version of Schaefer's Children's Reports of Parental Behaviour Inventory (CRPBI) (Schaefer, 1965). This revised version of the CRPBI was 'developed from item and factor analyses of the initial version' (Renson et al, 1965; p. 2). Each of the 18 discrete components of parental behaviour (scales of the CRPBI) is described by either 8 or 16 items, selected on the basis of high predicted item variability, high predicted item-scale correlation, applicability of the item to both maternal and paternal behaviour, and results of factor loadings on the isolated factors. Internal-consistency reliabilities for the scales ranged from .55 to .86, using normal boys as subjects. The items are statements describing 'concrete, specific, and easily observable parent behaviours'. In answering the statements, the subject has to read each of them at a time and then indicate whether it is Like, Somewhat Like, or Not Like his parents' behaviour by circling the appropriate one. Items are

scored with Like having a score of 3, Somewhat Like 2, and Not Like 1. There are separate but identical forms for mother and father. Schaefer (op cit) had isolated three factors of Acceptance vs Rejection, Psychological Control, and Lax vs Firm Control underlying the 18 scales of the CRPBI using American subjects. Renson (cited in Renson et al, op cit) had administered a translated French form of the CRPBI to 182 French-speaking (Walloon) public high school students in Belgium and obtained three equivalent factors, using the judgmental criterion of high scale loadings. Renson's findings suggest that there may be cross-cultural validity for the CRPBI.

The CRPBI components of parental behaviour were also found to represent a comprehensive sample of characteristic behaviours of Singapore parents in the upbringing of their children. The method of assessing these components through children's report of retrospective perception of specific parental behaviours matched this study's approach of assessing psychosocial variables from the child's attribution of intent. Both these considerations led to the selection of the CRPBI scales of parent behaviour as affective variables for this study. These scales (Appendix III shows their item descriptions) together with their expected underlying factors are presented for reference here:

| Factors | Affective Variables (CRPBI Scales) |
|---|---|
| 1) Acceptance vs Rejection | 1.1 Acceptance of Individuation |
| | 1.2 Acceptance |
| | 1.3 Positive Involvement |
| | 1.4 Childcentredness |
| | 1.5 Possessiveness |
| | 1.6 Intrusiveness |

| | |
|---|---|
| 2) Psychological Control | 2.1 Control through guilt |
| | 2.2 Hostile control |
| | 2.3 Control through instilling persistent anxiety |
| | 2.4 Control through withdrawal of relationships |
| | 2.5 Rejection |
| | 2.6 Hostile detachment |
| 3) Lax vs Firm Control | 3.1 Inconsistent discipline |
| | 3.2 Nonenforcement |
| | 3.3 Extreme autonomy |
| | 3.4 Lax discipline |
| | 3.5 Control |
| | 3.6 Enforcement |

Process Domain. The identification of these variables followed the Chicago methodology (Wolf, 1964b). The variables were arrived at through a comparative study of items in the Dyer (1967), Mosychuk (1969), Marjoribanks (1970), and MacArthur (personal communication) interview schedules, and guidance from developmental psychology. The list included the first six of Marjoribank's press variables and two of MacArthur's process variables, interpreted in terms of local descriptive characteristics. Below is the list of variable names, followed by their corresponding environmental characteristics:

| Process Variables | Characteristics |
|---|---|
| 1) Press for School-achievement | 1.1 Parental aspirations for the education of the child. |
| | 1.2 Preparation and planning for child's education |
| | 1.3 Parental interest in child's educational progress |

| | | |
|---|---|---|
| 2) Press for Activeness | 2.1 | Extent and content of indoor activities |
| | 2.2 | Extent and content of outdoor activities |
| | 2.3 | Extent and purpose of the use of T.V. and other media |
| 3) Press for Intellectuality | 3.1 | Number of thought provoking activities engaged in by child |
| | 3.2 | Opportunities made available for thought provoking discussions and thinking |
| | 3.3 | Use of books, periodicals and other related literature |
| 4) Press for Independence | 4.1 | Freedom and encouragement to explore the environment |
| | 4.2 | Stress on early independence |
| 5) Press for English | 5.1 | Language usage and reinforcement |
| | 5.2 | Opportunities available for language usage |
| 6) Press for Ethlanguage | 6.1 | Ethlanguage usage and reinforcement |
| | 6.2 | Opportunities available for ethlanguage usage |
| 7) Model Identification | 7.1 | Identification with models who have successful careers |
| | 7.2 | Identification with models with high educational achievements |
| | 7.3 | Identification with models for their extensive knowledge |
| 8) Planfulness in Family | 8.1 | Planning in major family duties |
| | 8.2 | Punctuality in carrying out plans |
| | 8.3 | Delayed gratification |

Status Domain. The variables in this domain included those which have been consistently identified as correlates of abilities in Euro-American culture as well as the local variables which are closely

associated with these (see Section on Samples).

Status Variables -
1) Family size
2) Family structure
3) Father's occupation
4) Father's education
5) Mother's occupation
6) Mother's education
7) Home induction to school instructional languages
8) Type of house
9) Material wealth in the home
10) Education of siblings
11) Educational level of highest wage earner, not parents
12) Occupational status of highest wage earner, not parents

A semi-structured questionnaire named Home Environment Questionnaire (HEQ) was developed to obtain data on the process and status variables.

Pilot Testing

A pilot testing on the HEQ and the revised version of the Schaefer CRPBI was carried out with a sample of subjects equivalent to those who were to be subjects for the final study. To minimize the test-taking demands on the subjects and in keeping with Euro-American trends in using maternal data, it was decided to pilot test on the mother form of the revised version of the Schaefer CRPBI. Pilot testing was carried out with pupils in schools other than the four selected for the main study (Appendix IV). The instruments were administered by the writer personally to the subjects in their classrooms, class by class (each class size averaging 35). This method was adopted in all

the testing sessions for two reasons, 1) to minimize the inconvenience to teachers and the disruption of lessons, and hence establish good rapport with school administrators, and 2) better pupil cooperation could be achieved when pupils saw that everyone in the class was involved. In total, 180 pupils were tested.

Treatment of HEQ pilot data. The pilot data were examined to detect any ambiguity in the phraseologies of questions and alternative responses provided. This was done in the light of cues resulting from the questions subjects raised during the HEQ-taking sessions. As a result of this analysis, slight changes were made in the starting lists of process variables and status variables, and some of the questions in the original version of the HEQ. The final form given to the actual subjects in the main study appears under Appendix I.

In the case of questions (22-65) on the process variables, those having 'Other Answer' responses were included for sorting out the data into more general categories like the response categories for each item in the Rating Scale (Appendix II). After this categorization had been done, a set of items together with their corresponding response categories belonging to two of the variables (all the status variables were given as one set) were given to a different group of three teacher-judges each. The judges were told to rate the response categories to each item or combinations of sub-items (re Rating Scale, Appendix II) on a 7-point scale in terms of their relationship to school-achievement. The writer also rated these response categories independently before obtaining the returns from the judges. The Rating Scale

(Appendix II) was developed out of the average ratings (rounded to the next highest integer) of the judges on each of the response categories.

There was almost perfect judges' agreement on the ratings of the response categories to the status questions for the 'Planfulness in the Family' and 'Model Identification' process variables. In the case of the response categories to the 'Press for School-achievement', 'Press for Activeness', 'Press for Intellectuality', 'Press for Independence', and 'Press for English' process variables, the reliability of judges' ratings was not that evident. To check on this, the reliability of rating on the response categories by the judges was estimated separately for each of these five variables, using the one-factor analysis of variance for repeated measures, the formula of which is:

Reliability of judges' rating, $r_j = \frac{k\hat{\theta}'}{1+k\hat{\theta}'}$

where $\hat{\theta}' = \frac{MS_{bet\ response\ categories} - mMS_{w\ response\ categories}}{mkMS_{w\ response\ categories}}$ .

and $k$ = number of judges, $n$ = no. of response categories

$m = \frac{n(k-1)}{n(k-1)-2}$

(Winer, 1971; p. 288)

The values of $r_j$ for each of these variables are shown in Table 1.

TABLE 2

RELIABILITY OF JUDGES' RATINGS
ON FIVE PROCESS VARIABLES

| Process Variables | Reliability |
|---|---|
| Press for School-achievement | .95 |
| Press for Activeness | .96 |
| Press for Intellectuality | .93 |
| Press for Independence | .90 |
| Press for English | .90 |

To check on the reliability of the whole HEQ instrument, a random sample of 40 subjects was selected from the subjects who took the instrument and r was computed on the responses of these 40 cases using the same design as above but the terms were interpreted as:

$$\hat{\theta}' = \frac{MS_{bet\ persons} - mMS_{w\ persons}}{mkMS_{w\ persons}}$$

k = number of items

n = no. of people

(Winer, 1971; p. 284-287)

The value for the reliability of the items, r was found to be .87 in this case. Thus HEQ was found to have satisfactory reliability of measurement.

Treatment of CRPBI (Mother Form) Data. This piloting exercise was done to obtain some preliminary feel on the subjects' reactions to the phraseology and format of the instrument. The other purpose of this piloting was to enable the writer to arrive at an appropriate way of administering the instrument to subjects in the main study. From the experience gained in this piloting it was confirmed that the

original plan to read out each statement and let the subjects follow silently was a better approach than the Schaefer method of allowing them to read on their own. Thus this was made the standard administrative procedure for the subjects in the main study. No change was made in the items as a result of information obtained during the CRPBI-taking sessions.

## CHAPTER VI

## PSYCHOSOCIAL MEASURES, ABILITY MEASURES AND ADMINISTRATIVE PROCEDURES

### Measures in the Psychosocial Variable Domains

Arising from the pilot data analyses, these psychosocial variables were finally included in each of the three domains of affective, process and status variables. The HEQ question number(s) corresponding to each process variable and status variable are given beside each variable in brackets below while the CRPBI items describing each of the affective variables are given in Appendix III.

Affective Domain -

1) Acceptance of individuation
2) Acceptance
3) Positive involvement
4) Childcentredness
5) Possessiveness
6) Intrusiveness
7) Control through guilt
8) Hostile control
9) Control through instilling persistent anxiety
10) Control through withdrawal of relationships
11) Rejection
12) Hostile detachment
13) Inconsistent discipline
14) Nonenforcement
15) Extreme autonomy
16) Lax discipline
17) Control
18) Enforcement

Process Domain -
1) Press for School-achievement (Q22-29)
2) Press for Activeness (Q30-35)
3) Press for Intellectuality (Q36-41)
4) Press for Independence (Q42-48)
5) Model Identification (Q49-52)
6) Planfulness in Family (Q53-58)
7) Press for English (Q59-65)

Status Domain -
1) Number of Siblings (Q1-2)
2) Father's Occupation (Q3)
3) Father's Education (Q4)
4) Mother's Occupation (Q5)
5) Mother's Education (Q6)
6) Home Induction to School Instructional Languages (Q7)
7) Type of House (Q8-11)
8) Material Wealth (Q12-18)
9) Highest Educational Level of Sibling (Q19)
10) Educational Level of Highest Wage Earner, Not Parents (Q20-21)
11) Occupational Status of Highest Wage Earner, Not Parents (Q20-21)

Measures in the Ability Domain

Following the theoretical rationale discussed in Chapter III, a battery of tests was selected to define the predicted ability-factors on the basis of Euro-American data. Other criteria that guided the selection of these tests in the ability domain were: 1) the available published tests on these skills should meet the constraints of the testing mechanics, in this instance, they had to be group administered, 2) the attributes of the subjects in this study, such as their age, grade level and proficiency in English, and 3) tests that had already been tested with the Singapore school population, as in the case of

AH4, Raven's Standard Progressive Matrices, and Cube Comparisons Test. The school-achievement tests were selected in consultation with teachers who were knowledgeable in these school subjects and who had taught these grade levels in Singapore.

The tests together with their psychometric properties (whenever available) are briefly described below. Sample items of these tests appear in Appendix IX. The first 12 tests come from the French, Ekstrom, and Price (FEP) Kit of Reference Tests for Cognitive Factors (1963). French et al prepared this kit of selected tests to measure the 24 elementary ability-factors (by the definition of this study), which they inferred from their extensive review of 124 studies (French et al; 1963) to be relatively established.

1. Hidden Figures Test - This is one of the FEP kit tests, defining the factor Flexibility of Closure (Cf). It is a modification of Thurstone's original Gottschaldt Figures Test. It requires the subject to decide which of 5 geometrical figures is embedded in a complex pattern. The total test-taking time is 20 minutes, a time of 10 minutes for each of 2 parts.

2. Hidden Patterns Test - This is another FEP kit test and belongs to the same factor as the above test. It requires the subject to mark the outline of a given configuration in the 10 given geometrical 'patterns' in each item whenever the configuration occurs. The test consists of 2 parts, each requiring a test-taking time of 2 minutes.

3. Gestalt Completion Test - This is a FEP reference test for the factor, Speed of Closure (Cs). The test requires the subject to write

down the names of objects given in the form of disjointed drawings. Total test-taking time is 6 minutes, i.e. 3 minutes for each of the 2 parts.

4. Concealed Words Test - This test defines the same factor as test 3 above in the FEP kit. In this test words are given with disjointed letters. The subject's task is to write out the full words. Total test-taking time is 6 minutes, i.e. 3 minutes for each of two parts.

5. Letter Sets Test - This is a FEP reference test for the Induction (I) factor. It consists of items, each having 5 sets of 4 letters. The subject's task is to find the rule which relates 4 of the sets and mark the odd one in the fifth set. The test consists of 2 parts, each part being given a test-taking time of 7 minutes.

6. Figure Classification - This test belongs to the same FEP factor as test 5. Each of its items consists of 2 rows, the first of which presents 2 or 3 groups of geometrical figures which are alike according to some rules to be discovered by the subject. The second row of the item consists of another set of geometrical figures for the subject to assign to each of the groups in row 1 according to the discovered rule. The test consists of 2 parts, each part requiring a test-taking time of 8 minutes.

7. Addition Test - This is one of the reference tests for the FEP factor, Number Facility (N). It is a speeded test of addition of sets of three 1- or 2-digit numbers. It has 2 parts, each requiring a test-taking time of 2 minutes.

8. Division Test - This test describes the same FEP factor as test 7.

It measures the subject's speed and accuracy in dividing 2- or 3-digit numbers by single digit numbers. The test has 2 parts, each part taking 2 minutes.

9. Subtraction & Multiplication Test - This also defines the same factor as tests 7 and 8. It measures the subject's speed and accuracy in alternately subtracting 2-digit numbers from 2-digit numbers and multiplying 2-digit numbers by single digit numbers. The test has 2 parts, each requiring 2 minutes of test-taking time.

10. Card Rotation Test - This is a reference test for the FEP factor, Spatial Orientation (S). Each of its items consists of a drawing of an irregularly shaped card on the left of a vertical line and 8 other irregularly shaped cards on the right of the same line. The subject's task is to identify which of the 8 cards is the same or different from the reference card on the left side of the vertical line. The total test-taking time is 8 minutes for 2 parts, with 4 minutes for each part.

11. Cube Comparisons Test - This test also belongs to the FEP kit and describes the same factor as test 10. Each of its test item consists of 2 drawings of a cube, the faces of which are marked by different capital letters. The subject is required to indicate whether the drawings in each item are of the same or different cube(s). Total test-taking time for the 2 parts of the test is 6 minutes, with 3 minutes for each part.

12. Form Board Test - This test defines the Visualization factor (Vz) in the FEP kit. Each of its test items consists of 5 shaded drawings of 2-D geometrical forms, some or all of which when put together can

form a given 2-D geometrical figure which is either a square, a triangle, a hexagon, or a cross. The subject's task is to indicate which of the drawings when fitted together will form the outline of the given geometrical figure. The test has two parts, each part requiring a test-taking time of 8 minutes.

The above 12 tests from the French et al Kit of Reference Tests for Cognitive Factors (op cit) have no information on the psychometric properties such as reliability, norming, and validity for these reasons:

> "Such information has not been included because these tests are suggested for the single purpose of factorial research. It may be expected that the use of these tests will ordinarily cause the named factors to appear."
> (French et al, 1963; p. 2)

13. Group Embedded Figures Test - This is one of the Witkin instruments for assessing the field-dependence-independence style of cognitive functioning. This test requires the subject to find a given simple form which is hidden in an obscure manner within a complex pattern. The test prevents the subject from seeing the reference simple form from the complex pattern simultaneously by having the whole set of 8 reference simple forms printed at the back of the test booklet, to which the subject may turn as frequently as he likes. The normative samples reported in the test manual were all less than 100 in size and were drawn from undergraduates. However, in this writer's opinion (based on testing experience with Singapore pupils), the subjects for this present study would have no difficulty in coping with the test items. Based on undergraduate subjects, the reported Spearman-Brown corrected correlation

between the two halves of the test was .82 for both sexes. Validity coefficients obtained with other measures of the Witkin battery as criterion variables showed that it correlated highest with the Individual Embedded Figures Test and least, with the Portable Rod and Frame Test, and moderately with the Witkin ABC test of body articulation for both sexes.

14. Raven Standard Progressive Matrices Test - This is a test which has been claimed to have a high g loading. It consists of a series of 60 items, perceptually presented. These 60 problems are classified into 5 sets of 12 each, named Set A, Set B, ....Set E in order of progressive complexity. Each set begins with a very simple problem, intended to be self-evident and to introduce the theme developed in it. The themes employed in the whole test, arranged in order of increasing complexity are A) Continuous Patterns, B) Analogies Between Pairs of Figures, C) Progressive Alterations of Patterns, D) Permutations of Figures, and E) Resolution of Figures into Constituent Parts. Each problem requires the testee to identify the logical relations between an incomplete matrix or pattern of 2-dimensional geometrical figures and then to select from a set of 6 or 8 figures that which would complete the matrix according to these relations.

It has been used extensively in cross-cultural studies and has been tested with Singapore samples for its adaptability for use with Singapore school population. The normative results from a sample of 12,600 secondary school pupils from 39 secondary schools in Singapore (Phua, 1971) led the investigator to conclude that the test could be

used with the Singapore school population without any adverse cultural disadvantage. The manual reported a test-retest reliability varying with age, the range of variation being .83-.93. Vernon (1961) in his study with 640 army recruits reported a K-R Formula 20 reliability of .85, and Banks and Sinha obtained a similar reliability of .91 in a study with 110 children in the age range of 8-13 years. A K-R formula 20 reliability of .88 had been obtained with Singapore subjects (Phua, op cit). The test manual also reported a validity coefficient of .86, using the Terman-Binet test as criterion.

Because each set in the test measures a different specific skill, and this specificity is quite compatible with the tasks in each test of the French et al kit, it was decided to treat each set separately as a discrete test in the test battery for factor analysis.

15. AH4 - This is a British omnibus test of general intelligence which the manual claims to be suitable for all children over 10 years of age. It consists of 2 parts, each part having 65 items and a test-taking time of 10 minutes.

Part I of the test has a verbal and numerical bias and measures 6 types of principles, namely, Directions, Verbal Opposites, Numerical Series, Verbal Analogies, Simple Arithmetic Computation, and Synonyms. Part II has a diagrammatic bias and includes these five principles - Analogies, Sames, Subtractions, Series and Superimpositions.

The subject is first introduced to the conventions of the questions and specificity of answers to each part through a practice exercise on the preliminary examples given, before he begins on the actual

questions in each part.

The manual reported a test-retest consistency for different groups of subjects to be generally over .90. The test correlated .65 with Raven Standard Progressive Matrices (1938) when carried out on British naval entrants. The manual claimed that test results generally showed significant agreement at the .005 level with examination results of British school children and University students. This test had also been tried out on another sample of Singapore secondary school pupils and the results though unreported, compared favourably with the normative data reported in the test manual.

For the same reasons stated in the Raven's Progressive Matrices test, each of the individual principles in AH4 was treated as an independent test variable in the test domain.

Achievement Tests - Tests for the three important subjects in the Singapore school curriculum were selected. They were the STEP tests level 4A in Reading, Mathematics and Science. This level represents the lowest difficulty level in a series of 4 levels, with each level having alternate forms A and B. The manual reported that level 4 is suitable for American pupils in the grade range 4-6. However, because of the heavy language content in these tests, and the fact that at the time of this testing program the Singapore pupils were only at the beginning of their 8th year of schooling, it was considered more appropriate to use this level than the higher level 3.

There are some features common among these tests: 1) each test comes in the form of a test booklet having equal number of items in

each of 2 parts, 2) each part of the test is allowed 35 minutes and the booklet may be administered in one or two sessions, depending on the testing schedule, 3) the tests were also constructed to function as power tests, 4) the tests consist of a number of groups of questions, with all questions in one group relating to the same situation, 5) questions are cast in the multiple-choice form, the subject has to choose the correct answer from among four alternatives, and 6) content validity was emphasized in their development and this was insured through the involvement of well-qualified persons in test construction.

16. Reading 4A - This test measures these abilities in reading comprehension*: 1) to reproduce ideas, 2) to translate ideas and make inferences, 3) to analyze author's motivations, 4) to analyze presentation, and 5) to criticize ideas presented, author's purpose and motivation and the presentation of materials. Each test booklet contains 70 multiple-choice questions, divided equally into 2 parts. Its internal consistency, estimated through the KR formula 20 and with American Grade 5 pupils, was reported to be .95. The standard error of measurement associated with this was 3.45.

17. Mathematics 4A - This instrument measures the following mathematical concepts*: 1) Number and operation, 2) Symbolism, 3) Measurement and geometry, 4) Function and relation, 5) Proof-deductive and inferential reasoning, and 6) Probability and statistics. The approximate percentage distribution of items involving each of these concepts are 51, 2,

*Sequential Tests of Educational Progress. Manual for interpreting scores (Reading, Mathematics and Science). Cooperative Test Division, ETS, Princeton, N.J. 1957.

29, 23, 4 and 4 in the same sequence as the concepts presented here. There are 50 items equally divided between 2 parts in each test booklet. Estimate of its internal consistency was reported to be .89 with a standard error of 3.05. This estimation was obtained from American Grade 5 pupils.

18. Science 4A - This contains 60 items, with 30 items in each of 2 parts. The skills tested and the approximate percentage of items (in brackets), in each skill area are*: 1) to identify and define scientific problems (10%), 2) to suggest or screen hypotheses (25%), 3) to select valid procedures (17%), 4) to interpret data and draw conclusions (23%), 5) to evaluate critically claims or statements made by others (12%), and 6) to reason quantitatively and qualitatively (13%). Distribution of questions among subject areas are as follows: Biology - 40%, Chemistry - 16%, Physics - 23%, Astronomy - 8%, Geology - 7%, and Meteorology - 6%. No test-retest reliability had been reported but estimate of internal consistency (KR 20) had been obtained with American Grade 5 pupils. This was reported to be .91 with a standard error of measurement of 3.35.

Test Administration Procedures

A testing time-table was worked out with school administrators concerned, in a way that did not disrupt the important subject lessons. A testing schedule was then drawn up as shown in Table 3 to fit this time-table.

*Sequential Tests of Educational Progress. Manual for interpreting scores (Reading, Mathematics and Science). Cooperative Test Division, ETS, Princeton, N.J. 1957.

TABLE 3

TESTING SCHEDULE

| Testing Sessions | Instruments | Time (mins.) |
|---|---|---|
| 1 | Addition | 10 |
| | Std. Raven Progressive Matrices | untimed |
| 2 | Step Reading 4A | 90 |
| 3 | Hidden Figures | 30 |
| | Division | 10 |
| | Concealed Words | 15 |
| 4 | Step Mathematics 4A | 90 |
| 5 | AH4 | 35 |
| | Form Board | 25 |
| 6 | Figure Classification | 25 |
| | Gestalt Completion | 15 |
| | Card Rotation | 15 |
| 7 | Step Science 4A | 90 |
| 8 | Hidden Pattern | 15 |
| | Letter Sets | 25 |
| | Subtraction + Multiplication | 10 |
| 9 | GEFT (Witkin) | 20 |
| | CRPBI (Mother Form) | untimed |
| 10 | HEQ | untimed |

*The Cube Comparisons Test scores were obtained from the Education Ministry's Examination Officer in charge of the Secondary II Aptitude Testing Program, as it is one of the components in the Aptitude Battery which these pupils had to take soon after this testing program was completed.

Each testing session lasted about an hour, except in the case of the STEP tests where time allowance for the taking of one test booklet in one session took 90 minutes. This was not an unusual lengthy test-taking session for these subjects because the usual test-taking time in school subject examinations is usually of this duration. Furthermore a break of 5 minutes was allowed for, in between the two parts of the test. The same schedule was followed for all the pupils in the four schools tested (list of participating schools appears in Appendix IV).

The writer carried out the test administration in class groups, in the pupils' own classrooms. Each class averaged 35 pupils. No teacher was present during the testing session as their presence might arouse undue anxiety in pupils who tended to suspect this testing program as part of the Aptitude Testing Exercise conducted by the Ministry of Education. The administration directions given in the manuals of each test were strictly adhered to. In those sessions where more than one test was administered, an interval of 5 minutes between tests was allowed. The whole testing program was carried out during the middle of March to the end of May, 1975.

Scoring for the cognitive tests followed the scoring procedures reported in the respective test manuals but raw scores were used for converting to normalized scores with a mean of 50 and a standard deviation of 10 within each ethnic group. This was the standard conversion scale for all the measures in the four domains.

# CHAPTER VII

## ANALYSIS I - WITHIN-DOMAIN FACTOR PATTERNS AND HYPOTHESES TESTING

### Within-Domain Factor Patterns

One purpose of the present study was to examine the factor patterns in the ability domain, affective domain, process domain, and status domain, defined and described in Chapters V and VI. This within-domain examination was performed with reference to two major ethnic groups in Singapore, having contrasting socio-cultural histories and learning similar school skills in a language that is not frequently used in their homes. The measures and samples for this purpose have been described in detail in the preceding chapters. This chapter presents analysis for the within-domain factor patternings with respect to the Chinese and Malay samples, and examines how the emergent factors support the hypotheses proposed for investigation.

### Within-Ability-Domain Factor Patterns

The 32 test measures in the ability domain were scored and converted into normalized scores with a mean of 50 and standard deviation of 10 for each ethnic sample separately. The raw score means and standard deviations on these 32 measures for the Chinese and Malay samples are presented in Appendix V. Two correlation matrices, one for each ethnic sample (Appendix VI), were computed from the respective sample normalized scores. Using principal axes factoring procedures, and unities in the main diagonal of the correlation matrix, each ethnic

correlation matrix was factor analyzed separately. With reference to eigenvalue plots in Figure 1 (Cattell, 1966) and the criterion of eigenvalue greater than 1 (Harman, 1967; p. 198), nine principal component factors were extracted from each ethnic correlation matrix. These nine factors accounted for 66.34% and 66.91% of the total variance for the Chinese and Malay correlation matrices respectively. Table 4 presents the eigenvalues and percentage of total variance accounted for by these nine unrotated principal component factors for both ethnic matrices. For interpretation, these nine factors were then orthogonally rotated by Varimax method and finally transformed to oblique simple structure by the promax method (Hendrikson & White, 1964).

Tables 5 and 6 present the promax oblique first-order factor patterns of the Chinese sample and Malay sample respectively. An examination of the factor loadings (arbitrarily considering coefficients $> .30$ as substantial contributions) shows that there is considerable similarity between the Chinese and Malay patterns on a number of factors. Greater consideration to establish the similarity or dissimilarity between the two factor patterns is necessary for studying the relationships of these ability-factors to familial psychosocial circumstances and for interpreting the resulting factors in relation to the socio-cultural contexts of these two samples. In accordance with this need, the Kaiser, Hunka, and Bianchini factor-matching procedure for oblique factors (1971) was performed on the factor matrices, with the Chinese factor matrix as the target. This Kaiser et al procedure

FIGURE 1

EIGENVALUE PROFILES FOR THE TEST MEASURES
(PRINCIPAL AXES FACTOR ANALYSES FOR CHINESE AND MALAY SAMPLES)

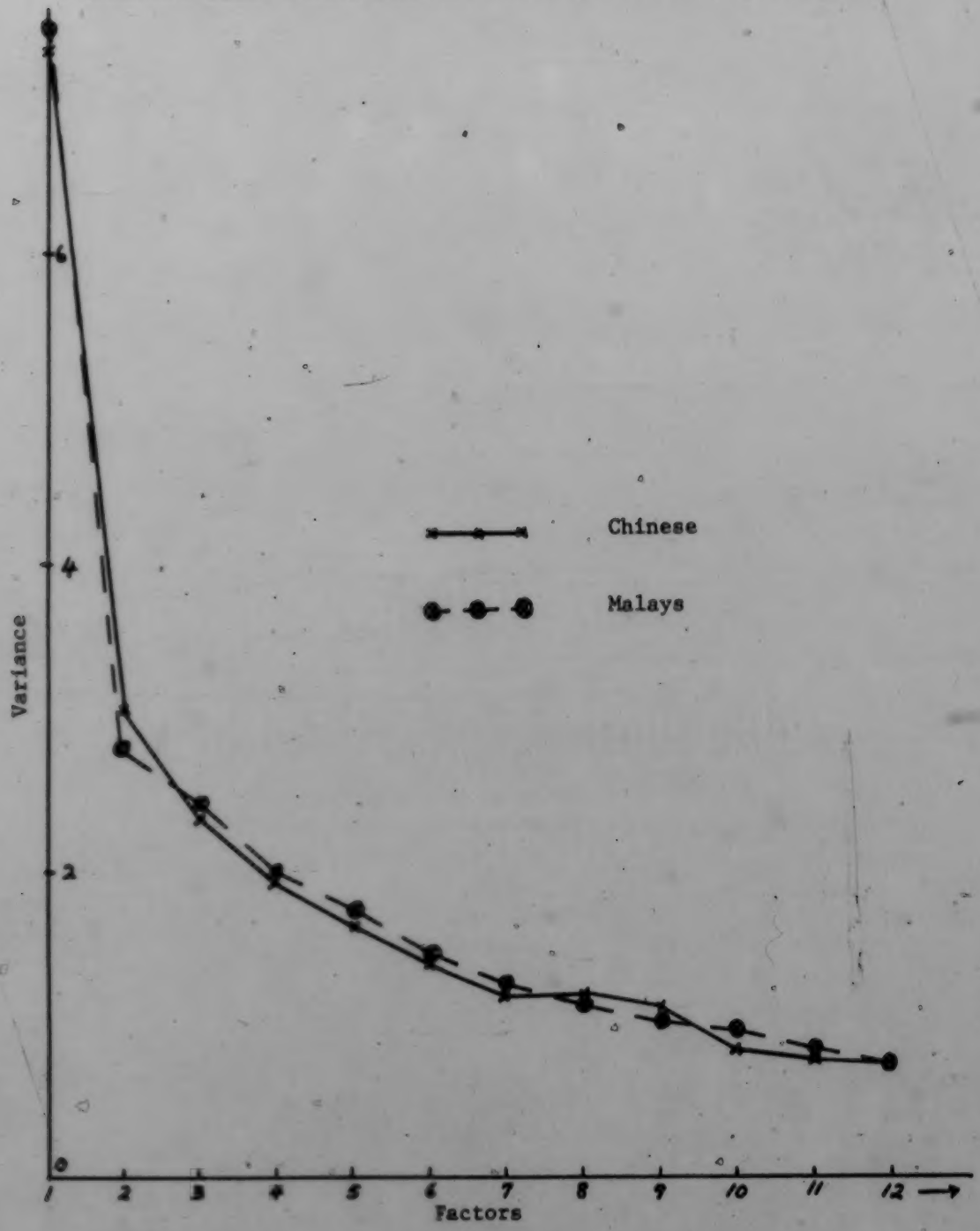

TABLE 4

EIGENVALUES AND PERCENTAGE OF TOTAL VARIANCE ACCOUNTED FOR BY FIRST 9 UNROTATED PRINCIPAL COMPONENTS (ELEMENTARY ABILITY-FACTORS)

| FACTORS | PERCENT. TOTAL VAR. CHINESE | MALAYS | EIGENVALUES CHINESE | MALAYS |
|---|---|---|---|---|
| 1 | 22.845 | 23.383 | 7.310 | 7.482 |
| 2 | 32.351 | 32.102 | 3.042 | 2.790 |
| 3 | 39.711 | 39.625 | 2.355 | 2.407 |
| 4 | 45.772 | 45.938 | 1.939 | 2.020 |
| 5 | 50.799 | 51.438 | 1.609 | 1.760 |
| 6 | 55.255 | 56.053 | 1.426 | 1.477 |
| 7 | 59.045 | 60.069 | 1.213 | 1.285 |
| 8 | 62.812 | 63.684 | 1.205 | 1.157 |
| 9 | 66.341 | 66.908 | 1.130 | 1.032 |

TABLE 5

CHINESE PROMAX OBLIQUE FIRST-ORDER ABILITY PATTERN* (N = 147)

| | ABILITY-FACTORS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | VI | VII | VIII | IX | $h^2$ |
| 8 Sameh | 906 | -013 | 100 | -020 | -046 | -128 | -029 | 090 | 003 | 806 |
| 10 Series | 881 | 034 | 078 | -050 | -008 | 021 | -077 | -007 | -012 | 825 |
| 7 Analogies | 866 | -065 | -060 | 065 | 015 | 070 | -009 | -025 | -024 | 756 |
| 9 Subtractions | 842 | -068 | 070 | 044 | 009 | 041 | 016 | 105 | 018 | 802 |
| 11 Superimpositions | 742 | -017 | 023 | -030 | 040 | -185 | 097 | -038 | 240 | 653 |
| 17 Subtraction + Multiplication | -082 | 886 | 022 | 097 | 021 | -064 | 004 | -001 | -007 | 814 |
| 15 Addition | 045 | 840 | -003 | -118 | -203 | 087 | 034 | 030 | 163 | 755 |
| 16 Division | -035 | 815 | 117 | 091 | 158 | -190 | -046 | -026 | -031 | 745 |
| 2 Verbal Opposites | 081 | 130 | 789 | -011 | -073 | -076 | 055 | 104 | 039 | 689 |
| 4 Verbal Analogies | 096 | -198 | 605 | 053 | 056 | 194 | -012 | -098 | 047 | 576 |
| 6 Synonyms | -092 | -073 | 569 | 524 | -121 | -083 | -041 | -082 | -073 | 630 |
| 5 Simple Arith. Computation | 121 | 130 | 551 | 070 | 153 | 015 | -112 | 184 | -194 | 571 |
| 1 Directions | 117 | 022 | 415 | -023 | -052 | 154 | -110 | -081 | 038 | 298 |
| 14 Science | 007 | 034 | -033 | 861 | 165 | -066 | -048 | -099 | 014 | 766 |
| 12 Reading | 065 | -108 | 336 | 726 | -097 | -122 | -014 | -024 | 105 | 700 |
| 13 Mathematics | -034 | 246 | -116 | 680 | 149 | 128 | 032 | 047 | 024 | 730 |
| 23 Hidden Figures | 033 | -081 | -092 | 161 | 763 | 235 | 153 | -110 | -013 | 741 |
| 25 GEFT (Witkin) | -012 | -107 | 037 | 032 | 750 | 168 | -086 | 146 | 016 | 657 |
| 24 Hidden Patterns | -054 | 234 | -005 | -012 | 669 | 085 | 026 | 009 | 286 | 701 |
| 22 Raven Prog. Matrices (E) | -029 | -096 | -013 | -093 | 235 | 874 | -028 | 104 | -171 | 668 |
| 20 Raven Prog. Matrices (C) | -075 | -056 | 093 | 076 | 228 | 636 | -191 | 197 | 023 | 590 |
| 21 Raven Prog. Matrices (D) | -094 | -062 | -152 | 036 | -107 | 510 | 206 | 352 | 275 | 612 |
| 3 Numerical Series | 056 | 283 | 379 | -269 | 042 | 450 | -023 | -287 | -035 | 657 |
| 28 Letter Sets | 007 | 133 | 176 | 150 | -004 | 321 | 242 | -190 | 021 | 417 |
| 30 Cube Comparison | 167 | 100 | 045 | 122 | -220 | 339 | 520 | 147 | -255 | 609 |
| 32 Form Board | 024 | -036 | -209 | -041 | 088 | 029 | 783 | -251 | 031 | 692 |
| 31 Card Rotation | -269 | -008 | 590 | -060 | -004 | -204 | 611 | 170 | 113 | 679 |
| 29 Figure Classification | 165 | 090 | -053 | -067 | 337 | -251 | 423 | 066 | -237 | 485 |
| 19 Raven Prog. Matrices (B) | 148 | 081 | -114 | 066 | -051 | 176 | -168 | 711 | 056 | 589 |
| 18 Raven Prog. Matrices (A) | -018 | -084 | 252 | -228 | 112 | 121 | 009 | 687 | 018 | 581 |
| 27 Concealed Words | 062 | 229 | -071 | 076 | 021 | -139 | -123 | 142 | 842 | 754 |
| 26 Gestalt Completion | 049 | -219 | 122 | -009 | 219 | -053 | 162 | -101 | 694 | 681 |
| Proportions of Total Variance | 120 | | | | | | | | | |
| | -001 | 082 | | | | | | | | |
| | 006 | 002 | 083 | | | | | | | |
| | 000 | 002 | 006 | 071 | | | | | | |
| | -000 | -000 | -001 | 002 | 066 | | | | | |
| | -002 | -003 | 002 | -002 | 003 | 073 | | | | |
| | -001 | 000 | 000 | -000 | 001 | -000 | 054 | | | |
| | -001 | 000 | 000 | -033 | 000 | 000 | -001 | 049 | | |
| | 001 | 000 | -000 | 000 | 002 | -004 | -000 | 001 | 052 | |
| | | | | | | | | | | 663 |

| Correlations among Oblique Elementary Abilities | | I | II | III | IV | V | VI | VII | VIII | IX |
|---|---|---|---|---|---|---|---|---|---|---|
| Inductive Reasoning I | I | - | | | | | | | | |
| Number Facility | II | 138 | - | | | | | | | |
| Verbal Reasoning | III | 407 | 191 | - | | | | | | |
| School-achievement | IV | 154 | 317 | 315 | - | | | | | |
| Flexibility of Closure | V | 288 | 108 | 293 | 147 | - | | | | |
| Inductive Reasoning II | VI | 282 | 296 | 289 | 325 | 086 | - | | | |
| Spatial + Visualization | VII | 186 | 095 | 056 | 019 | 143 | 100 | - | | |
| RPM(AB) | VIII | -064 | -032 | 001 | 119 | 097 | 019 | 091 | - | |
| Speed of Closure | IX | 144 | 028 | 122 | 076 | 155 | 353 | 071 | 097 | - |
| | SMCs | 254 | 165 | 274 | 227 | 159 | 301 | 064 | 047 | 148 |

* Decimal points omitted

TABLE 6

MALAY PROMAX OBLIQUE FIRST-ORDER ABILITY PATTERN* (N = 180)

| | ABILITY-FACTORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | VI | VII | VIII | IX | $h^2$ |
| 8 Sames | 1019 | -235 | -110 | -009 | -032 | -129 | 039 | 054 | 083 | 795 |
| 10 Series | 905 | -015 | -023 | 092 | -053 | -066 | 035 | -006 | 019 | 799 |
| 9 Subtractions | 846 | 048 | 069 | 008 | -026 | -048 | -023 | -066 | 086 | 779 |
| 11 Superimpositions | 805 | -004 | 115 | -118 | 095 | 010 | -256 | -001 | -032 | 711 |
| 7 Analogies | 786 | 173 | -119 | 075 | -088 | 048 | 076 | 038 | 141 | 701 |
| 19 Raven Prog. Matrices (B) | 017 | 915 | -056 | -064 | -128 | -094 | -038 | 067 | -023 | 682 |
| 21 Raven Prog. Matrices (D) | -173 | 923 | -022 | 043 | -051 | 011 | -004 | 060 | 187 | 690 |
| 20 Raven Prog. Matrices (C) | 059 | 758 | 014 | -002 | 098 | -183 | -079 | -030 | -060 | 644 |
| 18 Raven Prog. Matrices (A) | -013 | 754 | -077 | -334 | -113 | 154 | -074 | -058 | -035 | 559 |
| 22 Raven Prog. Matrices (E) | -006 | 619 | 086 | 053 | 136 | -098 | 004 | -016 | 001 | 534 |
| 14 Science | -184 | -016 | 868 | 195 | -026 | -056 | 003 | 032 | -129 | 740 |
| 12 Reading | 039 | 033 | 865 | -106 | -042 | -089 | -029 | -004 | -158 | 732 |
| 6 Synonyms | 048 | -309 | 713 | -211 | -083 | 120 | 200 | 137 | 148 | 546 |
| 13 Mathematics | 056 | 031 | 665 | 270 | 045 | -007 | -059 | -062 | -114 | 709 |
| 28 Letter Sets | -002 | 154 | 390 | 131 | 039 | 205 | 153 | -172 | 044 | 519 |
| 1 Directions | 045 | 293 | 357 | 033 | -210 | 281 | 016 | 089 | -150 | 438 |
| 5 Simple Arith. Computations | 222 | 130 | 363 | -010 | 109 | 068 | 082 | -086 | 019 | 480 |
| 17 Subtraction + Multiplication | 044 | -099 | 064 | 936 | -034 | -018 | -048 | 078 | 018 | 841 |
| 15 Addition | -037 | -017 | -107 | 887 | 084 | 013 | -092 | 085 | -080 | 739 |
| 16 Division | 071 | -071 | 288 | 738 | -091 | 012 | -077 | -065 | 109 | 732 |
| 24 Hidden Patterns | -061 | -063 | -090 | 034 | 908 | -037 | 070 | -068 | 025 | 719 |
| 23 Hidden Figures | -043 | -108 | 004 | -067 | 800 | 123 | -090 | 266 | -120 | 703 |
| 25 GEFT (Witkin) | 029 | 254 | 348 | -108 | 505 | -085 | -020 | 189 | 194 | 734 |
| 31 Card Rotation | -116 | -171 | 119 | -119 | 133 | 790 | -014 | -116 | 080 | 592 |
| 32 Form Board | -148 | 005 | -201 | 138 | -158 | 744 | -127 | 160 | 264 | 658 |
| 30 Cube Comparisons | 200 | -075 | -164 | 013 | 178 | 472 | 003 | -035 | -464 | 637 |
| 2 Verbal Opposites | -031 | -187 | 051 | -180 | 028 | -055 | 881 | -086 | 153 | 671 |
| 4 Verbal Analogies | -019 | 078 | 091 | -025 | -153 | -119 | 657 | 308 | -184 | 657 |
| 3 Numerical Series | -013 | 238 | -198 | 234 | 229 | 045 | 333 | -163 | 096 | 612 |
| 26 Gestalt Completion | -048 | 064 | 110 | 060 | 107 | 020 | -152 | 831 | 228 | 731 |
| 27 Concealed Words | 095 | 023 | -081 | 092 | 064 | -014 | 210 | 701 | -126 | 609 |
| 29 Figure Classification | 211 | 081 | -257 | 010 | 009 | 237 | 095 | 098 | 841 | 700 |
| Proportions of Total Variance | 129 | | | | | | | | | |
| | -003 | 118 | | | | | | | | |
| | -002 | -001 | 105 | | | | | | | |
| | 001 | -002 | 004 | 084 | | | | | | |
| | -002 | -003 | -001 | -001 | 064 | | | | | |
| | -004 | -003 | -001 | -000 | 001 | 055 | | | | |
| | -001 | -002 | 001 | 003 | 000 | -002 | 055 | | | |
| | 000 | -001 | -000 | -001 | 000 | 000 | 000 | 049 | | |
| | -001 | -002 | -000 | -000 | 000 | -002 | -002 | -001 | 043 | |
| | | | | | | | | | | 666 |

| Correlations among Oblique Elementary Abilities | | I | II | III | IV | V | VI | VII | VIII | IX |
|---|---|---|---|---|---|---|---|---|---|---|
| Inductive Reasoning | I | - | | | | | | | | |
| Inductive Reasoning | II | 396 | - | | | | | | | |
| School-achievement | III | 447 | 425 | - | | | | | | |
| Number Facility | IV | 259 | 192 | 295 | - | | | | | |
| Flexibility of Closure | V | 334 | 444 | 388 | 270 | - | | | | |
| Spatial + Visualization | VI | 263 | 209 | 103 | 233 | 219 | - | | | |
| Verbal Reasoning | VII | 271 | 264 | 298 | 236 | 149 | 206 | - | | |
| Speed of Closure | VIII | -102 | -096 | -004 | -135 | 014 | 013 | 027 | - | |
| Classification | IX | -089 | -193 | 019 | -004 | -106 | -125 | -223 | -138 | - |
| | SMCs | 309 | 347 | 371 | 189 | 286 | 143 | 196 | 075 | 123 |

* Decimal points omitted

rotates the Malay test vectors to maximum overlap with the target Chinese test vectors and computes the cosines for the angles between the Chinese factors and the resulting rotated Malay factors. The cosines for the angles between the Chinese oblique first-order ability-factors and the rotated Malay oblique first-order ability-factors are shown in Table 7. An indication of the degree of similarity between pairs of factors is given by the cosine value between the corresponding target factor and matched-factor.

It will be noticed that Table 7 does not display clearly defined high cosine values in either the rows or columns of its matrix. This is because the factors being compared are oblique and a factor in one pattern can be most like another factor in the other pattern while at the same time exhibit moderate similarity with another factor with which both these equivalent factors correlate highly in their own respective patterns. A case in point is the high cosine value between Chinese Factor IV and Malay Factor III as compared with the moderately high cosine value between Malay Factor III and Chinese Factor III. This is meaningful if interpreted in relation to the relatively high correlation between Chinese Factor IV and Factor III in the within-Chinese pattern (bottom of Table 5) and that between Malay Factor III and Factor VII, an equivalent of Chinese Factor III, in the within-Malay pattern (bottom of Table 6). The results in Table 7 show that the degree of similarity between 8 of the 9 factors in the Chinese, and Malay patterns falls within the acceptable values for mathematical

TABLE 7

FACTOR MATCHING FOR PROMAX OBLIQUE FIRST-ORDER ABILITY PATTERNS OF CHINESE AND MALAY SAMPLES (COSINE VALUES* BETWEEN CHINESE TARGET MATRIX AND THE KAISER ET AL ROTATED MALAY MATRIX)

| MALAY FACTORS \ CHINESE FACTORS | I | II | III | IV | V | VI | VII | IX | VII |
|---|---|---|---|---|---|---|---|---|---|
| I | 99 | 21 | 46 | 30 | 27 | 31 | 12 | 12 | -05 |
| IV | 21 | 98 | 15 | 29 | 09 | 36 | 13 | 16 | -15 |
| VII | 24 | 21 | 78 | -01 | -01 | 34 | -21 | 22 | -36 |
| III | 34 | 35 | 65 | 92 | 37 | 41 | -13 | 13 | 15 |
| V | 32 | 23 | 22 | 29 | 81 | 54 | 14 | 20 | -18 |
| II | 35 | 22 | 36 | 41 | 23 | 81 | -00 | 33 | 51 |
| VI | 29 | 18 | 37 | 19 | 04 | 37 | 88 | 11 | -07 |
| VIII | -05 | -25 | 01 | -00 | 14 | -10 | 10 | 87 | -00 |
| IX | -05 | 14 | 18 | -17 | 44 | 31 | 14 | -29 | 48 |

*Decimal points omitted

similarity (Hunka; personal communication).

Equivalent Chinese and Malay Ability-Factors. Interpretations of the results in Tables 5, 6, and 7 show that eight factors in the Chinese and Malay oblique first-order ability patterns may be considered to have close similarity. These eight relatively similar factors have been given common factor designations.

1) Inductive Reasoning I. This factor designation describes Chinese Factor I and Malay Factor I. The largest coefficients appear for the test measures constituting Part II components of AH4, namely, Sames, Series, Subtractions, Analogies and Superimpositions. Within-ethnic pattern correlations show that this factor correlates highly with Malay School-achievement factor (.447) but hardly so with Chinese School-achievement factor (.154).

2) Number Facility. This factor designation subsumes Chinese Factor II and Malay Factor IV. The most highly loaded test measures on this factor are the original three French, Ekstrom, and Price (FEP) tests describing this same named factor, namely, Subtractions and Multiplications, Addition, and Division in order of decreasing loading strengths as they appear in both Chinese Factor II and Malay Factor IV.

3) Verbal Reasoning. This characterizes Chinese Factor III and Malay Factor VII. Highest positive coefficients appear for test measures, Verbal Opposites, and Verbal Analogies (both are two of AH4 Part I components) for both Chinese and Malay factors. This factor correlates very highly with Inductive Reasoning I in the within-Chinese factor pattern but only moderately with the same factor in the within-Malay

pattern. For both ethnic samples, it has a school-achievement bias as is shown both by the relatively high cosine value between this Chinese factor and the Malay School-achievement factor and the relatively high correlation between this factor and the corresponding within-ethnic pattern School-achievement factor (mentioned above).

4) School-achievement. This interpretation applies to the equivalent Chinese Factor IV and Malay Factor III. As the name implies, this factor is defined by the achievement tests of STEP 4A Science, Reading and Mathematics in decreasing loading magnitude as they appear in both the Chinese and Malay factors. Apparently this is one single factor within the Malay pattern that correlates most highly with all the reasoning factors, and exhibits highest SMC with all the other within-Malay pattern factors. For the Chinese sample, this factor correlates relatively high with Number Facility, Verbal Reasoning, and Inductive Reasoning II but not to any appreciable extent with Inductive Reasoning I. Chinese School-achievement factor appears to be more sharply differentiated from its other within-Chinese pattern factors than what Malay School-achievement factor appears to be in the within-Malay pattern.

5) Flexibility of Closure. This describes the similar Chinese Factor V and Malay Factor V. Test measures which load highly on this factor are the original FEP tests of Hidden Figures and Hidden Patterns, and the Witkin Group Embedded Figures Test. This reproducibility of the factor in the Chinese and Malay patterns lends support to Euro-American stable findings on this factor (Hakstian & Cattell, 1974; Horn, 1972; Royce, 1973).

6) Spatial + Visualization. This interpretation is given to the equivalent Chinese Factor VII and Malay Factor VI on the basis that the highly loaded test measures on it come from the FEP Spatial and Visualization factors. This factor is defined by highest positive loadings from the Card Rotation test (a FEP Spatial Orientation test) and Form Board test (a FEP Visualization test) for both Chinese and Malay patterns. Another descriptive test measure of this factor in both ethnic patterns is the Cube Comparisons test, also a FEP Spatial-Orientation test. While equivalent test loadings and mathematical factor-match gave cooperative support to this close similarity between Chinese Factor VII and Malay Factor VI, the within-ethnic factor intercorrelations and SMCs show that Chinese Spatial + Visualization factor exists as a relatively independent factor and correlates least with School-achievement ability. On the other hand, its equivalent Malay factor though exhibiting relatively low correlation with School-achievement ability-factor, has moderate correlations with its within pattern reasoning ability-factors.

7) Speed of Closure. This designation is descriptive of Chinese Factor IX and its equivalent Malay Factor VIII. The test measures that represent good markers of this factor are the same FEP Speed of Closure tests, namely, Gestalt Completion and Concealed Words. The reproducibility of this factor in both Chinese and Malay patterns brings the total number of reproduced FEP elementary ability-factors here to be four. This reiterates the support for consistent findings on stable elementary ability-factors mentioned before. It is to be noted that Malay Speed of Closure factor is the most independent ability in its within-Malay-pattern while its Chinese equivalent though also relatively

independent, correlates substantially with the Inductive Reasoning II ability-factor.

8) Inductive Reasoning II. This common designation for Chinese Factor VI and Malay Factor II follows from the relatively high index of mathematical similarity between these two factors and the rather similar cluster of marker test measures. The main marker test measures for Chinese Factor VI are RPM(E), RPM(C) and RPM(D), and the main marker test measures for Malay Factor II are RPM(B), RPM(D), and RPM(C). However, the manner in which each of these two factors correlate with other factors in their respective ethnic-patterns seems to hint that this interpretation of similarity between them should be viewed with some reservations. Each of these two factors appear to correlate highly with a different one of two complementary aspects of the field articulation style of cognition (Witkin et al, 1971; p. 14) in each within-ethnic pattern - in the Chinese ability pattern, Factor VI correlates highest with the Speed of Closure factor (Structuring aspect) and in the Malay pattern Factor II's highest correlate is the Flexibility of Closure factor (Analytical aspect). Added to this is the relatively low correlation between Flexibility of Closure and Speed of Closure in both Chinese ability pattern and Malay ability pattern.

Unrelated Chinese and Malay Ability-Factors Chinese Factor VIII. This factor is described primarily by RPM(B) and RPM(A). Clearly it has no Malay counterpart. It is difficult to attach any meaningful interpretation to this factor both because of its limited number of describing test measures and its independent existence within the Chinese ability pattern. Hence it is given the designation of RPM(AB)

on account of its two main marker tests.

Malay Factor IX. This single Malay ability-factor which has no equivalent factor in the Chinese ability pattern, has only a highly loaded test measure, the Figure Classification Test from the FEP Induction elementary factor. Its limited number of describing test measures compounded by its relative independence within the Malay ability pattern makes it difficult to give it any psychological description other than to follow its solely defining test title. For this reason this factor is designated as Classification in the Malay ability pattern.

In summing up, the sampled 32 test measures in the Ability Domain are parsimoniously described by nine albeit not exactly equivalent promax oblique first-order factors for both the Chinese and Malay samples in this study. Seven clearly equivalent factors and one seemingly equivalent factor exist among Chinese promax oblique first-order ability pattern and Malay promax oblique first-order ability pattern. Table 8 shows the juxtaposition of these two patterns with their within-pattern factors rearranged so that the eight equivalent factors appear in corresponding columns of each pattern matrix.

The reproducibility of four out of five input FEP elementary ability-factors among these two ethnic patterns echoes the consistent Euro-American findings on the stability of elementary ability-factors. The emergence of the Verbal Reasoning and School-achievement factors in both ethnic patterns and their relatively high within-ethnic pattern SMCs (as attested by the results at the bottom of Tables 5 and 6) add

TABLE 8

PROMAX OBLIQUE FIRST-ORDER ABILITY* PATTERNS

FOR CHINESE AND MALAY SAMPLES ($N_C$ = 147, $N_M$ = 180)

| Test Numbers | CHINESE ABILITIES I | II | III | IV | V | VI | VII | IX | VIII | $h^2$ | MALAY ABILITIES I | IV | VII | III | V | II | VI | VIII | IX | $h^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 91 | -01 | 10 | -02 | -05 | -13 | -03 | 00 | 09 | 81 | 102 | -01 | 04 | -11 | -03 | -24 | -13 | 05 | 07 | 80 |
| 10 | 88 | 05 | 08 | -05 | -01 | 02 | -08 | -01 | -01 | 83 | 91 | 09 | 04 | -02 | -05 | -02 | -07 | -01 | 02 | 80 |
| 7 | 87 | -07 | -06 | 07 | 02 | 07 | -01 | -02 | -03 | 76 | 79 | 08 | 08 | -12 | -09 | 17 | 05 | 04 | 14 | 70 |
| 9 | 84 | -07 | 07 | 04 | 01 | 04 | 02 | 02 | 11 | 80 | 85 | 01 | -02 | 07 | -03 | 05 | -05 | -07 | 09 | 78 |
| 11 | 74 | -02 | 02 | -03 | 04 | -19 | 10 | 24 | -04 | 65 | 81 | -12 | -26 | 12 | 10 | -00 | 01 | -00 | -03 | 71 |
| 17 | -08 | 89 | 02 | 10 | 02 | -06 | 00 | -01 | -00 | 81 | 04 | 93 | -05 | 06 | -05 | -10 | -02 | 08 | 02 | 84 |
| 15 | 05 | 84 | -00 | -12 | -20 | 09 | 03 | 16 | 03 | 76 | -04 | 89 | -09 | -11 | 08 | -02 | 01 | 09 | -08 | 74 |
| 16 | -04 | 82 | 12 | 09 | 16 | -19 | -05 | -03 | -03 | 75 | 07 | 74 | -08 | 29 | -09 | -07 | 01 | -07 | 11 | 73 |
| 2 | 08 | 13 | 79 | -01 | -07 | -08 | 06 | 04 | 10 | 69 | -03 | -18 | 88 | 05 | 03 | -19 | -06 | -09 | 15 | 67 |
| 4 | 10 | -20 | 61 | 05 | 06 | 19 | -01 | 05 | -10 | 58 | -02 | -03 | 66 | 09 | -15 | 08 | -12 | 31 | -18 | 66 |
| 6 | -09 | -07 | 57 | 52 | -12 | -08 | -04 | -07 | -08 | 63 | 05 | -21 | 20 | 71 | -08 | -31 | 12 | 14 | 15 | 55 |
| 5 | 12 | 13 | 55 | 07 | 15 | 02 | -11 | -19 | 18 | 57 | 22 | -01 | 08 | 36 | 11 | 13 | 07 | -09 | 02 | 48 |
| 1 | 12 | 02 | 42 | -02 | -05 | 15 | -11 | 04 | -08 | 30 | 05 | 03 | 02 | 36 | -21 | 29 | 28 | 09 | -15 | 44 |
| 14 | 01 | 03 | -03 | 86 | 17 | -07 | -05 | 01 | -10 | 77 | -18 | 20 | 00 | 87 | -03 | -02 | -06 | 03 | -13 | 74 |
| 12 | 07 | -11 | 34 | 73 | -10 | -12 | -01 | 11 | -02 | 70 | 04 | -11 | -03 | 87 | -04 | 03 | -09 | -00 | -16 | 73 |
| 13 | -03 | 25 | -12 | 68 | 15 | 13 | 03 | 02 | 05 | 73 | 06 | 27 | -06 | 67 | 05 | 03 | -01 | -06 | -11 | 71 |
| 23 | 03 | -08 | -09 | 16 | 76 | 24 | 15 | -01 | -11 | 74 | -04 | -07 | -09 | 00 | 80 | -11 | 12 | 27 | -12 | 70 |
| 25 | -01 | -11 | 04 | 003 | 75 | 17 | -09 | 02 | 15 | 66 | 03 | -11 | -02 | 35 | 51 | 25 | -09 | 19 | 19 | 73 |
| 24 | -05 | 23 | -01 | -01 | 67 | 09 | 03 | 29 | 01 | 70 | -06 | 03 | 07 | -09 | 91 | -06 | -04 | -07 | 03 | 72 |
| 22 | -03 | -10 | -01 | -09 | 24 | 87 | -03 | -17 | 10 | 67 | -01 | 05 | 00 | 09 | 14 | 62 | -10 | -02 | 00 | 53 |
| 20 | -08 | -06 | 09 | 08 | 23 | 64 | -19 | 02 | 20 | 59 | 06 | -00 | -08 | 01 | 10 | 76 | -18 | -03 | -06 | 66 |
| 21 | -09 | -06 | -15 | 04 | -11 | 31 | 21 | 28 | 35 | 61 | -17 | 04 | -00 | -02 | -05 | 92 | 01 | 06 | 19 | 69 |
| 3 | 06 | 28 | 38 | -27 | 04 | 43 | -02 | -04 | -29 | 66 | -01 | 23 | 53 | -20 | 23 | 24 | 05 | -16 | 10 | 61 |
| 28 | 01 | 13 | 18 | 15 | -00 | 32 | 24 | 02 | -19 | 42 | -00 | 13 | 15 | 39 | 04 | 15 | 21 | -17 | 04 | 52 |
| 30 | 17 | 10 | 05 | 12 | -22 | 34 | 52 | -26 | 15 | 61 | 20 | 01 | 00 | -16 | 18 | -08 | 47 | -04 | -46 | 64 |
| 32 | 02 | -04 | -21 | -04 | 09 | 03 | 78 | 03 | -25 | 69 | -15 | 14 | -13 | -20 | -16 | 01 | 74 | 16 | 26 | 66 |
| 31 | -27 | -01 | 59 | -06 | -00 | -20 | 61 | 11 | 17 | 68 | -12 | -12 | -01 | 12 | 13 | -17 | 79 | -12 | 08 | 59 |
| 29 | 17 | 09 | -05 | -07 | 34 | -23 | 42 | -24 | 07 | 49 | 21 | 01 | 10 | -26 | 01 | 08 | 24 | 10 | 84 | 70 |
| 27 | 06 | 23 | -07 | 08 | -02 | -14 | -12 | 84 | 15 | 75 | 10 | 09 | -21 | -08 | 06 | 02 | -01 | 70 | -13 | 61 |
| 26 | -05 | -22 | 12 | -01 | 22 | -05 | 16 | 69 | -10 | 68 | -05 | 06 | -15 | 11 | 11 | 06 | 02 | 83 | 23 | 73 |
| 19 | 15 | 08 | -11 | 07 | -05 | -18 | -17 | 06 | 71 | 59 | 02 | -06 | -04 | -06 | -13 | 92 | -09 | 07 | -02 | 68 |
| 18 | -02 | -08 | 25 | -23 | 11 | -12 | 01 | 02 | 69 | 58 | -01 | -33 | -07 | -08 | -11 | 75 | 15 | -06 | -04 | 56 |

Proportions of Total Variance

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 12 | | | | | | | | | |
| -00 | 08 | | | | | | | | |
| 01 | 00 | 08 | | | | | | | |
| 00 | 00 | 01 | 07 | | | | | | |
| -00 | -00 | -00 | 00 | 07 | | | | | |
| -00 | -00 | 00 | -00 | 00 | 07 | | | | |
| -00 | 00 | 00 | -00 | 00 | -00 | 05 | | | |
| -00 | 00 | 00 | -03 | 00 | 00 | -00 | 05 | | |
| 00 | 00 | -00 | 00 | 00 | -00 | -00 | 00 | 05 | |

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Proportions of Total Variance

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | | | | |
| 00 | 08 | | | | | | | | |
| -00 | -00 | 06 | | | | | | | |
| -00 | 00 | 00 | 11 | | | | | | |
| -00 | -00 | 00 | -00 | 16 | | | | | |
| -00 | -00 | -00 | -00 | -00 | 12 | | | | |
| -00 | -00 | -00 | -00 | 00 | -00 | 06 | | | |
| -00 | -00 | 00 | -00 | 00 | -00 | 00 | 05 | | |
| 00 | -00 | -00 | -00 | 00 | -00 | -00 | -00 | 04 | |

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Correlations Among Oblique First Order-Abilities

| | I | II | III | IV | V | VI | VII | IX | VIII |
|---|---|---|---|---|---|---|---|---|---|
| I | - | | | | | | | | |
| II | 14 | - | | | | | | | |
| III | 41 | 19 | - | | | | | | |
| IV | 15 | 32 | 32 | - | | | | | |
| V | 29 | 11 | 29 | 15 | - | | | | |
| VI | 28 | 30 | 29 | 33 | 09 | - | | | |
| VII | 17 | 10 | 06 | 02 | 14 | 10 | - | | |
| IX | 14 | -03 | 00 | 12 | 10 | 02 | 07 | - | |
| VIII | -06 | 03 | 12 | 08 | 16 | 35 | 09 | 10 | - |
| SMCs | 25 | 17 | 27 | 23 | 16 | 30 | 06 | 15 | 05 |

Correlations Among Oblique First-Order Abilities

| | I | IV | VII | III | V | II | VI | VIII | IX |
|---|---|---|---|---|---|---|---|---|---|
| I | - | | | | | | | | |
| IV | 26 | - | | | | | | | |
| VII | 27 | 24 | - | | | | | | |
| III | 45 | 30 | 30 | - | | | | | |
| V | 33 | 27 | 15 | 39 | - | | | | |
| II | 40 | 19 | 26 | 43 | 44 | - | | | |
| VI | 26 | 23 | 21 | 40 | 22 | 21 | - | | |
| VIII | -10 | -14 | 03 | -00 | 01 | -10 | 01 | - | |
| IX | -09 | -00 | -22 | -02 | -11 | -19 | -13 | -14 | - |
| | 31 | 19 | 20 | 37 | 29 | 35 | 14 | 08 | 12 |

* Decimal points omitted

credibility to the original rationale of describing this ability domain as representing school-related skills.

The unrelated Chinese and Malay ability-factors are not clearly defined. They appear to be sparked off by the instrument specificity of the isolated defining tests. Malay School-achievement ability-factor stands out as the factor which exhibits highest correlation with all the other within-Malay pattern factors as shown by its highest SMC at the bottom of Table 6. In addition all the within-Malay-pattern reasoning factors show highest correlations with the School-achievement factor. The Chinese School-achievement factor appears to be more differentiated from the other within-Chinese pattern factors than the Malay School-achievement factor is from its own pattern factors, its SMC having only a within-Chinese pattern rank of 4.

Within-Affective-Domain Factor Patterns.

Following the Schaefer method of scoring the items in the CRPBI, scores on the 18 scales were computed from the item scores (Appendix III). The means and standard deviations on these variables appear in Appendix VII. The raw scale scores were converted to normalized scores with a mean of 50 and a standard deviation of 10 separately for each ethnic sample. Intercorrelations among the 18 normalized scale scores were computed separately for the Chinese and Malay data. The Chinese and Malay matrices of intercorrelations (Appendix VIII) were each factor analyzed, using the same factoring procedures as the Renson et al study (op cit), of principal component factoring and orthogonal Varimax rotation. Table 9 shows the unrotated principal component factors for both samples.

TABLE 9

UNROTATED PRINCIPAL COMPONENT FACTORS* OF CRPBI
(MOTHER FORM) FOR CHINESE AND MALAY SAMPLES
(NChinese = 144, NMalay - 190)

| CRPBI Scales | CHINESE FACTORS 1 | 2 | 3 | $h^2$ | MALAY FACTORS 1 | 2 | 3 | 4 | $h^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Acceptance of Individuation | 528 | -562 | 402 | 755 | 595 | -279 | 470 | -039 | 655 |
| Acceptance | 598 | -597 | 310 | 810 | 578 | -548 | 365 | 081 | 774 |
| Positive Involvement | 730 | -503 | 244 | 845 | 624 | -417 | 380 | 094 | 716 |
| Child-centredness | 695 | -449 | 203 | 726 | 575 | -460 | 322 | 098 | 656 |
| Possessiveness | 758 | -076 | 032 | 582 | 621 | -135 | -033 | -257 | 470 |
| Intrusiveness | 733 | -315 | -124 | 652 | 622 | -313 | -308 | 253 | 644 |
| Control through Guilt | 747 | 170 | -068 | 592 | 589 | -126 | -274 | -353 | 563 |
| Hostile Control | 824 | 087 | -267 | 757 | 599 | -123 | -304 | 264 | 536 |
| Control through Instilling Persistent Anxiety | 717 | 264 | -246 | 644 | 638 | 202 | -287 | -367 | 664 |
| Control through Withdrawal of Relationships | 536 | 520 | -136 | 576 | 716 | 289 | 012 | -064 | 601 |
| Rejection | 364 | 801 | 073 | 780 | 506 | 626 | -086 | -010 | 656 |
| Hostile Detachment | 250 | 776 | 091 | 673 | 450 | 692 | -014 | 115 | 695 |
| Inconsistent Discipline | 417 | 498 | 353 | 547 | 499 | 476 | -075 | -056 | 484 |
| Nonenforcement | 026 | 539 | 652 | 717 | 171 | 632 | 189 | 546 | 762 |
| Extreme Autonomy | -002 | 095 | 836 | 708 | 133 | 471 | 680 | 055 | 705 |
| Lax Discipline | 236 | 191 | 750 | 654 | 415 | 329 | 420 | -367 | 592 |
| Control | 754 | 018 | -364 | 700 | 581 | -311 | -319 | 247 | 597 |
| Enforcement | 656 | 303 | -375 | 664 | 637 | 176 | -325 | 130 | 559 |
| Variance Totals | 6.227 | 3.528 | 2.627 | 12.382 | 5.475 | 2.989 | 1.844 | 1.020 | 11.329 |
| % of Common Variance | 50.289 | 28.495 | 21.215 | 100.000 | 48.331 | 26.388 | 16.274 | 9.007 | 100.000 |
| % of Total Variance | 34.592 | 19.601 | 14.593 | 68.787 | 30.418 | 16.608 | 10.242 | 5.669 | 62.938 |

* Decimal points omitted

Three principal component factors with eigenvalues greater than unity were obtained with the Chinese data. These three factors were orthogonally rotated by the Varimax method. In the case of the Malay matrix, four principal component factors with eigenvalues greater than 1 were obtained but only the three factors with eigenvalue substantially greater than 1 were extracted and rotated orthogonally by the Varimax method. This was guided by the closeness in these first 3 factors with the three Chinese factors and the low variance contribution from the fourth factor (Table 9).

The emergent CRPBI scale patterns for the Chinese and Malay samples were compared with that obtained for the Walloons by Renson (op cit). Table 10 shows the orthogonal Varimax rotated factors for the Walloon (Renson et al, 1965), Chinese, and Malay groups for a comparative study. An examination of the scale loadings on the Varimax rotated factors showed that the three factors were similar on all three ethnic groups. Differences in the patterns existed in the differential sequencing of equivalent factors within each pattern (Table 10).

Acceptance vs Rejection Factor: Walloon Factor 1, Chinese Factor 2, and Malay Factor 3. This factor has high positive loadings on Acceptance, Positive Involvement, Childcentredness, and Acceptance of Individuation for all three ethnic groups, though the high negative loading on Hostile Detachment in the Walloon case was less pronounced in the Chinese data and more so with the Malay data.

TABLE 10

VARIMAX ROTATED FACTORS* OF CRPBI FOR WALLOON: CHINESE AND MALAY SAMPLES (NWalloons = 182, NChinese = 144, NMalays = 190)

| | WALLOON FACTORS | | | CHINESE FACTORS | | | MALAY FACTORS | | |
|---|---|---|---|---|---|---|---|---|---|
| CRPBI Scales | 1 | 2 | 3 | 2 | 1 | 3 | 3 | 1 | 2 |
| Acceptance | 91 | 11 | -11 | 90 | -03 | -04 | 84 | -24 | 11 |
| Positive Involvement | 89 | -07 | 10 | 90 | -20 | -04 | 81 | -24 | -03 |
| Child-centredness | 85 | -17 | -11 | 82 | -22 | -03 | 76 | -26 | 05 |
| Acceptance of Individuation | 81 | 22 | -15 | 86 | 04 | -13 | 78 | -14 | -15 |
| Possessiveness | 54 | -52 | -05 | 55 | -53 | -08 | 39 | -48 | -16 |
| Intrusiveness | 34 | -67 | 16 | 65 | -45 | 18 | 29 | -70 | 07 |
| Hostile Control | 06 | -86 | 15 | 38 | -78 | 09 | 19 | -65 | -08 |
| Control through Guilt | 06 | -83 | -07 | 34 | -68 | -11 | 20 | -62 | -09 |
| Control through Instilling Persistent Anxiety | -12 | -76 | 09 | 19 | -78 | -00 | 06 | -62 | -38 |
| Rejection | -56 | -64 | -28 | -31 | -66 | -50 | -09 | -74 | -32 |
| Control through Withdrawal of Relationships | -38 | -63 | -16 | -07 | -73 | -20 | 26 | -45 | -57 |
| Hostile Detachment | -74 | -42 | -28 | -36 | -55 | -49 | -11 | -22 | -79 |
| Nonenforcement | -13 | -07 | -72 | -15 | -04 | -83 | -09 | 11 | -67 |
| Lax Discipline | 45 | 07 | -63 | 26 | 02 | -77 | 35 | 05 | -58 |
| Extreme Autonomy | 05 | 22 | -61 | 20 | 29 | -77 | 30 | 45 | -64 |
| Inconsistent Discipline | -20 | -50 | -48 | 03 | -43 | -60 | -01 | -33 | -61 |
| Control | 14 | -60 | 51 | 35 | -73 | 22 | 26 | -68 | 09 |
| Enforcement | -20 | -68 | 39 | 09 | -80 | 10 | 04 | -65 | -35 |
| % Common Variance | | | | 36.51 | 40.07 | 23.42 | 31.22 | 33.63 | 33.15 |
| % Total Variance | | | | 25.16 | 27.56 | 16.11 | 17.88 | 20.41 | 18.99 |

*Decimal points omitted

Factor Designations by column ordering within-ethnic samples:

Column 1 - Acceptance vs Rejection

Column 2 - Psychological Control

Column 3 - Lax vs Firm Control

Psychological Control Factor: Walloon Factor 2, Chinese Factor 1, and Malay Factor 1. The most highly loaded scales on this factor are Hostile Control, Control through Guilt, and Control through Instilling Persistent Anxiety for the Walloon group; Enforcement, Hostile Control, Control through Guilt, and Control through Instilling Persistent Anxiety for the Chinese group; and Intrusiveness, Control, Hostile Control, Enforcement, Control through Guilt, and Control through Instilling Persistent Anxiety for the Malay group.

Lax vs Firm Control; Walloon Factor 3, Chinese Factor 3, and Malay Factor 2. Highest positive loadings on this factor are contributed by the Nonenforcement, Lax Discipline, and Extreme Autonomy for both the Walloon and Chinese groups. In the case of the Malay group, these scale loadings are relatively high, but not the highest. This factor also has highest negative loading on the Control scale for the Walloon and Chinese groups, but not for the Malay group.

To investigate the similarity between the Chinese and Malay factor loading matrices, the Kaiser et al factor-matching procedure for orthogonal factors (op cit) was performed on the matrices, with the Chinese Varimax factor matrix as the target. The cosines for the angles between the target Chinese factors and the matched Malay factors are shown in Table 11. The same factor-matching procedure was replicated with the Walloon-Chinese and Walloon-Malay sets of factor loading matrices, using the Walloon factor matrix as the target for rotation to maximum overlap of scale vectors. The results of these two factor-matches are also shown in Table 11.

TABLE 11

KAISER ET AL ROTATED CRPBI COSINE VALUES*
BETWEEN TARGET FACTOR MATRIX AND ROTATED
FACTOR MATRIX FOR THREE ETHNIC SAMPLES

| ROTATED REFERENCE AXES \ TARGET REFERENCE AXES | | WF1 | WALLOONS WF2 | WF3 |
|---|---|---|---|---|
| CHINESE | CF2 | 964 | 065 | 257 |
| | CF1 | -078 | 996 | 040 |
| | CF3 | -253 | -058 | 966 |
| | | WF1 | WALLOONS WF2 | WF3 |
| MALAYS | MF3 | 994 | -081 | 078 |
| | MF1 | 079 | 997 | 019 |
| | MF2 | -079 | -012 | 997 |
| | | CF1 | CHINESE CF2 | CF3 |
| MALAYS | MF1 | 925 | 174 | -339 |
| | MF3 | -102 | 970 | 221 |
| | MF2 | 367 | -170 | 915 |

*Decimal points omitted

Factor Designations:

Acceptance vs Rejection - CF2, MF3, WF1
Psychological Control - CF1, MF1, WF2
Lax vs Firm Control - CF3, MF2, WF3

It will be noticed that unlike Table 7, Table 11 shows distinctly high cosine values for the angles between similar factors. This is because the factors in this case are orthogonal ones. The results in all the three factor-matches show that the three major factors underlying the CRPBI scales, obtained with the Walloon, Chinese, and Malay samples may be considered to be equivalent. This supports the subjective matching in terms of high scale loadings.

Within-Process-Domain Factor Patterns.

The 7 process variables listed under measures in the process domain were scored according to the Rating Scheme in Appendix II. The means and standard deviations of the raw scores on these variables appear in Appendix VII. The raw scores were converted to normalized scores with a mean of 50 and a standard deviation of 10 separately for each ethnic sample. Intercorrelations among the normalized scores on these 7 variables were computed for the Chinese and Malay samples separately. Each of the resulting ethnic correlation matrix (Appendix VIII) was factor analyzed using the same factoring procedures and rotational method as had been performed on the cognitive tests.

Applying the same factor extracting criteria as had been done for the ability patterns (Figure 2), two unrotated principal component factors were obtained for the Chinese, and Malay correlation matrix separately. Table 12 presents these two unrotated factors with their corresponding eigenvalues and percentage of total variance accounted for. The promax oblique first-order process patterns for both Chinese and Malay samples appear in Table 13.

FIGURE 2

EIGENVALUE PROFILES FOR THE PROCESS VARIABLES
(PRINCIPAL AXES FACTOR ANALYSES FOR CHINESE AND MALAY SAMPLES)

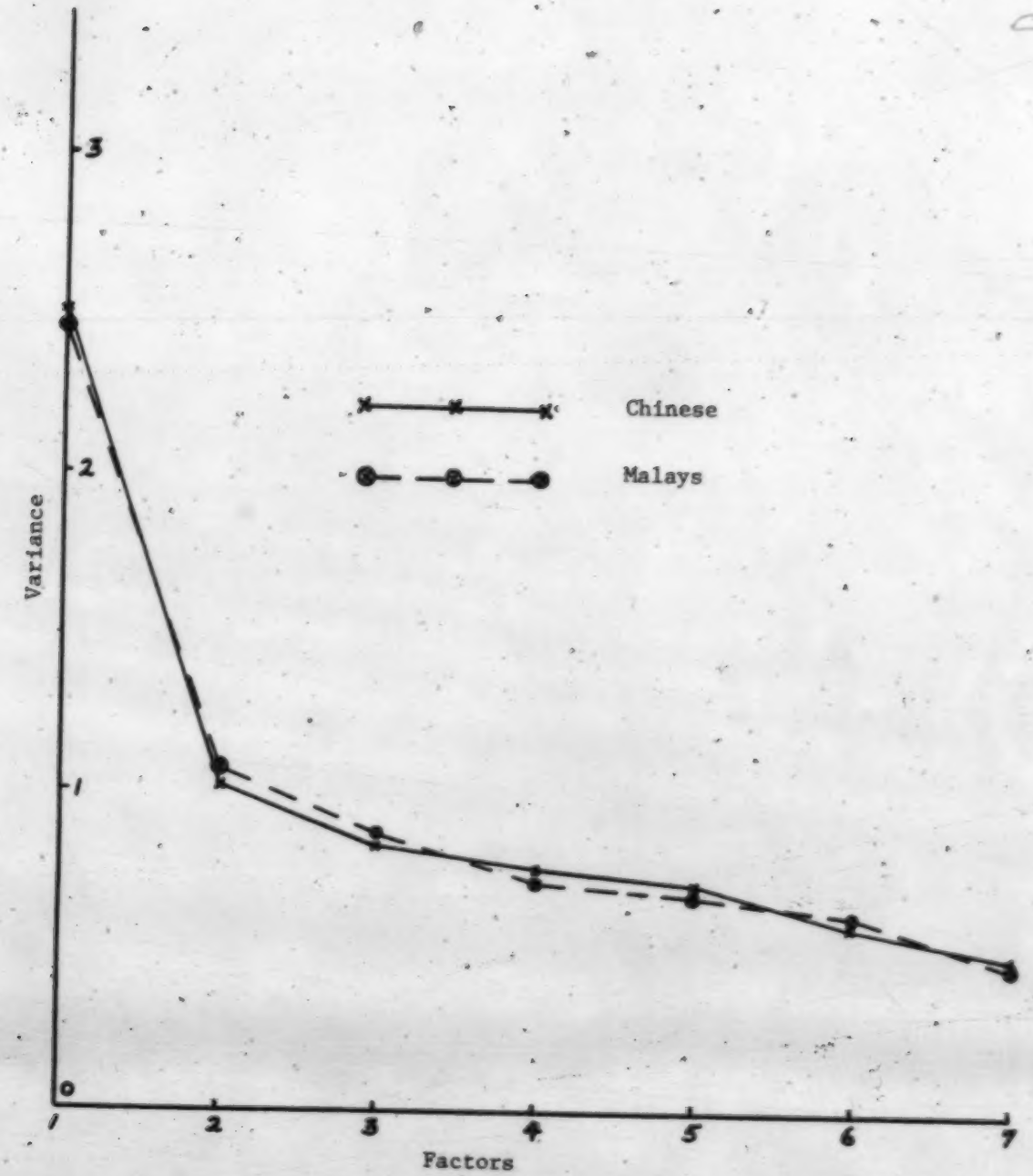


TABLE 12

CHINESE AND MALAY FIRST-ORDER UNROTATED PROCESS-FACTORS* WITH THEIR ASSOCIATED EIGENVALUES AND PERCENTAGE OF TOTAL VARIANCE

| Process Variables | CHINESE FACTORS | | | MALAY FACTORS | | |
|---|---|---|---|---|---|---|
| | I | II | $h^2$ | I | II | $h^2$ |
| 1. Press for School-achievement | 676 | -296 | 544 | 609 | -323 | 476 |
| 2. Press for Activeness | 673 | 241 | 511 | 726 | 258 | 594 |
| 3. Press for Intellectuality | 617 | 267 | 451 | 712 | 097 | 517 |
| 4. Press for Independence | -379 | 821 | 817 | -073 | 872 | 766 |
| 5. Model Identification | 548 | -019 | 301 | 445 | 270 | 271 |
| 6. Planfulness in Family | 534 | -108 | 296 | 573 | -273 | 403 |
| 7. Press for English | 715 | 353 | 635 | 737 | 055 | 546 |
| Eigenvalues | 2.529 | 1.027 | 3.555 | 2.482 | 1.091 | 3.573 |
| Percentage Total Variance | 36.123 | 14.666 | 50.789 | 35.454 | 15.592 | 51.047 |

*Decimal points omitted

TABLE 13

PROMAX OBLIQUE FIRST-ORDER PROCESS PATTERNS*
FOR CHINESE (N = 145) AND MALAY (N = 172) SAMPLES

| Process Variables | Chinese Factors | | | Malay Factors | | |
|---|---|---|---|---|---|---|
| | I | II | $h^2$ | I | II | $h^2$ |
| Press for English | 874 | -200 | 635 | 735 | 015 | 546 |
| Press for Activeness | 753 | -087 | 511 | 803 | -196 | 594 |
| Press for Intellectuality | 725 | -131 | 451 | 727 | -030 | 517 |
| Model Identification | 447 | 168 | 301 | 535 | -236 | 271 |
| Planfulness in Family | 366 | 263 | 296 | 449 | 340 | 403 |
| Press for INdependence | 313 | -1013 | 817 | 267 | -912 | 766 |
| Press for School-achievement | 341 | 509 | 544 | 465 | 395 | 476 |
| Proportions of Total Variance | I 344 | | | I 355 | | |
| | II -042 | 207 | | II -016 | 171 | |
| | | | 509 | | | 510 |
| Correlations Among Oblique First-Order Factors | | I | II | | I | II |
| Learning Environment | I | - | | I | - | |
| Independence vs School-achievement Motivation | II 483 | | - | II 282 | | - |

*Decimal points omitted

The same factor-matching procedure as had been done on the Chinese and Malay promax oblique first-order ability patterns was also carried out on these Chinese and Malay promax oblique first-order process-factor patterns. Table 14 shows the results of the mathematical factor-match. The Chinese and Malay promax oblique first-order process patterns are interpreted to be similar both from the loading strength of variables and the mathematical indices of similarity.

The two Chinese and Malay equivalent process-factors are designated as Learning Environment, defined by main marker variables, such as 'Press for English', 'Press for Activeness', and 'Press for Intellectuality'; and Independence vs Parental School-achievement Motivation with main marker variables such as 'Press for Independence' (high negative loading) and 'Press for School-achievement' (moderate positive loading).

Within-Status-Domain Factor Patterns.

The same scoring, factoring, and rotational procedures, and factor extraction criteria (Figure 3), as had been done with the variables in the Process Domain were performed on the 11 status variables, for the Chinese and Malay sample separately. The Chinese and Malay raw score means and standard deviations of these variables appear in Appendix VII, together with those of the other psychosocial variables. The Chinese and Malay matrices of intercorrelations among the normalized scores on the 11 status variables appear in Appendix VIII.

Four unrotated principal component factors were extracted from

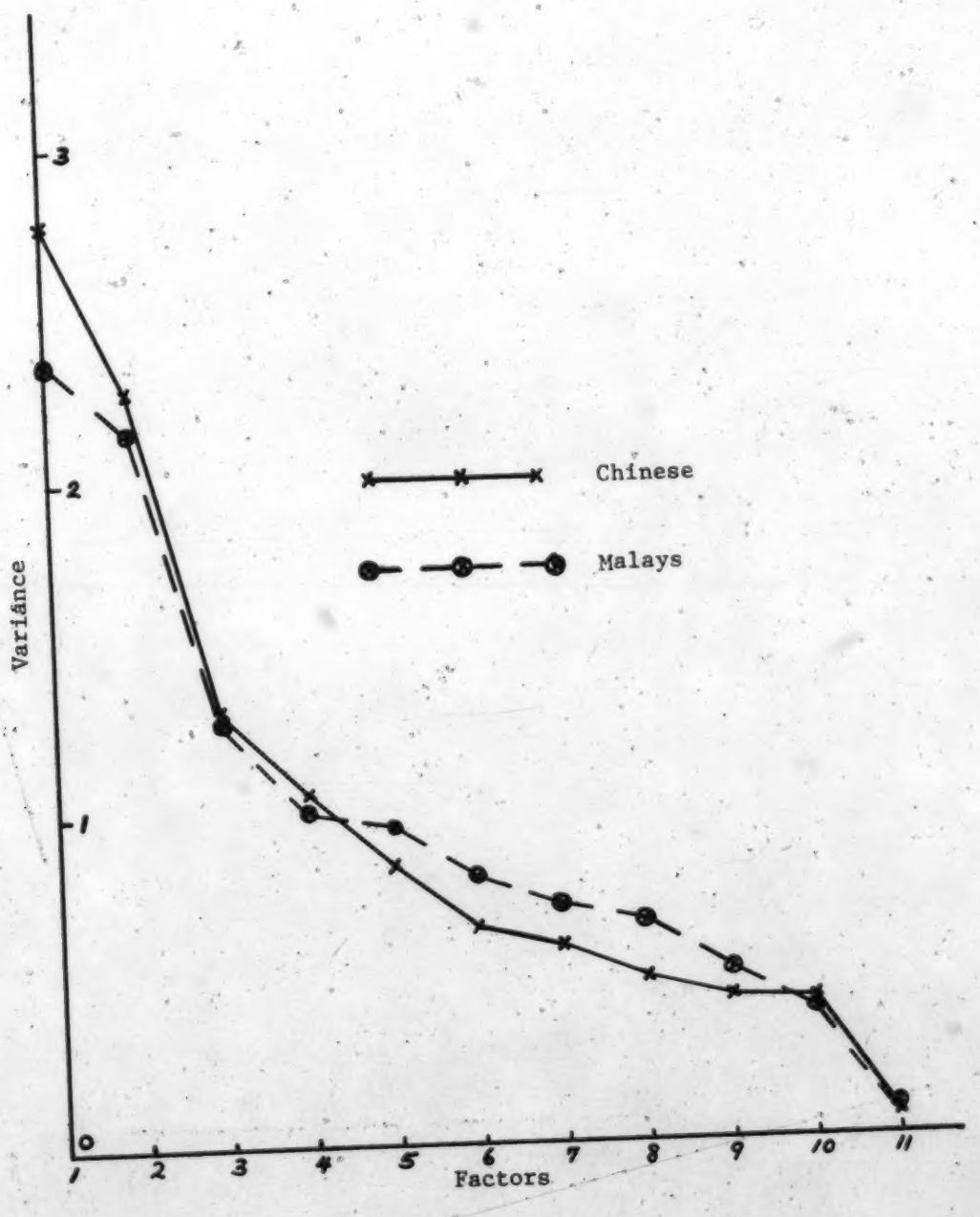
TABLE 14

KAISER ET AL ROTATED PROCESS COSINE VALUES BETWEEN TARGET FACTOR MATRIX AND ROTATED FACTOR MATRIX

| TARGET REFERENCE AXES / ROTATED REFERENCE AXES | | CHINESE | |
|---|---|---|---|
| | | I | II |
| MALAYS | I | .989 | .610 |
| | II | .133 | .932 |

FIGURE 3

EIGENVALUE PROFILES FOR THE STATUS VARIABLES
(PRINCIPAL AXES FACTOR ANALYSES FOR CHINESE AND MALAY SAMPLES)



the Chinese and Malay correlation matrix separately. Table 15 presents these four unrotated principal component factors together with their associated eigenvalues and percentage of total variance for the Chinese and Malay samples. The Chinese and Malay promax oblique first-order status-factor patterns are juxtaposed under Table 16. Using variable loading strength as the judgmental criterion, two of the factors may be considered as equivalent across ethnic patterns, while the remaining two Malay factors represent the fission products of one of the remaining two Chinese factors. The same factor-matching procedure as had been done on the Chinese and Malay process patterns was also carried out on these Chinese and Malay promax oblique first-order status-factor patterns. The results of this factor-match (Table 17) confirm the loading interpretations.

Chinese Factor II is similar to Malay Factor I and is designated as Elder's Occupational-Educational (O-E) Status on the basis of the common main marker variables - 'Educational Level of Highest Wage Earner, Not Parents', 'Occupational Status of Highest Wage Earner, Not Parents', and 'Highest Educational Level of Siblings'. Chinese Factor III and Malay Factor III are equivalent and are interpreted as Sibling Size vs Maternal O-E Status as their highest loadings are contributed by these same variables, namely, 'Sibling Size', 'Mother's Occupation', and 'Mother's Education'. Chinese Factor I interpreted as Paternal O-E Status + Material Index on the basis of high loadings from these variables of 'Father's Occupation', 'Father's Education', 'Material

TABLE 15

CHINESE AND MALAY FIRST-ORDER UNROTATED STATUS-FACTORS*
WITH THEIR ASSOCIATED EIGENVALUES AND PERCENTAGE OF TOTAL VARIANCE

| Status-Variables | CHINESE FACTORS | | | | | MALAY FACTORS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | $h^2$ | I | II | III | IV | $h^2$ |
| Number of Siblings | -034 | 502 | -600 | 198 | 653 | 351 | -287 | -247 | 495 | 511 |
| Father's Occupation | 764 | -153 | -056 | -171 | 639 | 317 | 639 | -239 | 273 | 640 |
| Father's Education | 770 | -145 | 184 | -151 | 670 | 254 | 731 | -148 | 343 | 739 |
| Mother's Occupation | -097 | -024 | 663 | 312 | 547 | 095 | 400 | 716 | -156 | 706 |
| Mother's Education | 606 | -161 | 466 | -004 | 611 | 128 | 677 | 391 | 083 | 635 |
| Home Induction to Sch. Instr. Languages | 150 | -013 | 088 | 840 | 735 | 278 | 108 | 284 | 070 | 174 |
| Type of House | 746 | -025 | -233 | 121 | 626 | 265 | 325 | -419 | -535 | 638 |
| Material Wealth | 729 | 024 | -258 | -017 | 599 | 296 | 377 | -323 | -463 | 548 |
| Highest Educational Level of Siblings | 341 | 556 | -094 | 327 | 542 | 613 | -062 | -233 | 145 | 456 |
| Ed. of Highest Wage Earner, Not Parents | 081 | 910 | 259 | -175 | 933 | 855 | -349 | 211 | -088 | 904 |
| Occ. of Highest Wage Earner, Not Parents | 089 | 907 | 253 | -164 | 920 | 838 | -363 | 205 | -116 | 890 |
| Eigenvalues | 2.796 | 2.285 | 1.322 | 1.073 | 7.476 | 2.358 | 2.161 | 1.307 | 1.016 | 6.841 |
| Percentage of Total Variance | 25.414 | 20.769 | 17.688 | 14.356 | 67.959 | 21.439 | 19.643 | 11.878 | 9.235 | 62.195 |

*Decimal points omitted

TABLE 16

PROMAX OBLIQUE FIRST-ORDER STATUS PATTERNS*

FOR CHINESE (N = 145) AND MALAY (N = 172) SAMPLES

| Status Variables | Chinese Factors II | III | I | IV | $h^2$ | Malay Factors I | III | II | IV | $h^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Education of Elders | 996 | -001 | -040 | -142 | 933 | 995 | 126 | -140 | 043 | 904 |
| Occupation of Elders | 967 | -006 | -033 | -131 | 920 | 989 | 120 | -171 | 063 | 890 |
| Highest Educational level of Sib | 364 | -243 | 197 | 367 | 542 | 469 | -231 | 276 | 094 | 456 |
| Mother's Occupation | 148 | 635 | -228 | 378 | 547 | 199 | 868 | 013 | -088 | 706 |
| Mother's Education | 099 | 536 | 565 | 084 | 611 | -039 | 633 | 467 | -050 | 635 |
| Number of Siblings | 135 | -737 | -081 | 157 | 653 | 252 | -433 | 204 | -307 | 511 |
| Father's Occupation | -048 | 043 | 806 | -125 | 639 | -103 | 008 | 785 | 122 | 640 |
| Father's Education | 055 | 274 | 783 | -082 | 670 | -179 | 110 | 857 | 032 | 739 |
| Material Wealth | -025 | -213 | 739 | 017 | 599 | 093 | -018 | 126 | 705 | 548 |
| Type of House | -103 | -178 | 731 | 164 | 626 | 067 | -115 | 058 | 793 | 638 |
| Home Induction to School Languages | -237 | 070 | -037 | 897 | 735 | 290 | 310 | 120 | -113 | 174 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Proportions of Total Variance | II | 203 | | | | I | 221 | | | |
| | III | 001 | 132 | | | III | -009 | 141 | | |
| | I | -001 | -001 | 251 | | II | -012 | 002 | 164 | |
| | IV | -014 | 001 | -001 | 109 | IV | -001 | -003 | 004 | 116 |
| | | | | | 680 | | | | | 623 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Correlations Among Oblique First-Order Factors | | II | III | I | IV | I | III | II | IV |
| | II | - | | | | I - | | | |
| | III | -172 | - | | | III -221 | - | | |
| | I | 070 | -022 | - | | II 220 | 045 | - | |
| | IV | 275 | -096 | 157 | - | IV -047 | 147 | 168 | - |
| Squared Multiple Correlations SMCs | | 098 | 032 | 025 | 097 | 105 | 073 | 085 | 051 |

*Decimal points omitted

Factor Designations

Elder's Occupational - Educational Status - Chinese Factor II, Malay Factor I

Sibling Size vs Maternal Occupational-Educational Status - Chinese Factor III, Malay Factor III

Paternal Occupational-Educational Status + Material Index - Chinese Factor I

Paternal Occupational-Educational Status - Malay Factor II

Material Index - Malay Factor IV

Home Induction to School Languages - Chinese Factor IV

TABLE 17

KAISER ET AL ROTATED STATUS COSINE VALUES BETWEEN TARGET FACTOR MATRIX AND ROTATED FACTOR MATRIX

| TARGET REFERENCE AXES / ROTATED REFERENCE AXES | | CHINESE II | CHINESE III | CHINESE I | CHINESE IV |
|---|---|---|---|---|---|
| MALAYS | I | 1.00 | -.20 | .05 | .53 |
| | III | .18 | .97 | .20 | .06 |
| | II | .12 | .14 | .83 | .65 |
| | IV | .51 | .15 | .81 | .66 |

Wealth', and 'Type of House', is highly related to both Malay Factor II and Malay Factor IV. Variable loadings reveal that the main marker variables of Malay Factor II and Malay Factor IV taken together represent the same defining variables of Chinese Factor I. Thus, Malay Factor II is designated as Paternal O-E Status and Malay Factor IV is named as Material Index. The single unrelated Chinese Factor IV is designated as Home Induction to School Languages on the basis that this is the only highly loaded variable on this factor.

## Within-Domain Hypotheses Testing

### Testing of Within-Ability Domain Hypotheses

Hypothesis 1. This expected the emergent ability-factors underlying the selected test measures in the ability domain to be similar to the predicted ability-factors of Verbal Reasoning, Number Facility, Induction, Flexibility of Closure, Speed of Closure, Spatial + Visualization, and School-achievement for both Chinese and Malay samples.

The extent to which obtained and expected factorial descriptions of the ability domain corresponds for the two ethnic samples will determine whether findings are supportive of this hypothesis. In juxtaposing the hypothesis and the summary on the descriptions of the within-ethnic promax oblique first-order ability patterns and between-ethnic promax oblique first-order ability patterns, the correspondence between the outlined expectations and the equivalent emergent factorial

descriptions is clearly apparent.

Seven equivalent elementary ability-factors defined on the basis of Euro-American norms were expected and this agrees fairly well with the seven distinctively similar elementary ability-factors obtained with both Chinese and Malay samples. Of these seven clearly equivalent ability-factors, four were reproduced from the original five input FEP equivalent elementary ability-factors. These included Number Facility, Flexibility of Closure, Speed of Closure, and Spatial + Visualization. Only the FEP elementary ability-factor of Induction expected on the basis of the input of its describing tests of Letter Sets and Figure Classification did not emerge. Instead these two tests align themselves on different factors in both Chinese and Malay patterns. In the Chinese pattern, Letter Sets loads moderately on Chinese Inductive Reasoning II and Figure Classification distributes its contribution among the Flexibility of Closure factor and the Spatial + Visualization factor. In the Malay pattern, Letter Sets loads moderately on the School-achievement factor while Figure Classification stands out alone as the single test defining the only Malay factor unrelated to any Chinese factors, thereby making it difficult to interpret.

In summing up, the overall picture shows that there is close agreement between the findings and expectations pertaining to the ability-factors underlying the ability domain, and hence Hypothesis 1 is supported.

Hypothesis 2. This predicted that the Chinese School-achievement factor would exhibit sharper differentiation from

all the other ability-factors in the within-Chinese pattern than the Malay School-achievement factor would in the within-Malay pattern.

The within-ethnic pattern intercorrelations and SMCs among ability-factors at the bottom of the Chinese promax oblique first-order ability pattern (Table 5) and Malay promax oblique first-order ability pattern (Table 6) provide information for testing this hypothesis. Sharper differentiation between ability-factors is shown by the lower inter-correlations and lower SMCs among them.

The within-ethnic factor intercorrelations show that rather similar ability-factors appear to correlate with the School-achievement factor for both Chinese and Malay samples. Within the Malay ability pattern the School-achievement factor shows negligible correlations with Spatial + Visualization, Speed of Closure, and Classification. Generally, Chinese School-achievement factor appears to show lower within-ethnic pattern factor intercorrelations than the Malay School-achievement factor shows in its within-pattern factors.

In addition, the SMCs show that Chinese School-achievement is not the ability-factor within the Chinese pattern which exhibits highest multiple correlation with the other within-Chinese pattern factors. In fact its SMC ranks fourth in comparison with the other within-Chinese pattern factors. The same situation does not exist with the Malay School-achievement factor. Malay School-achievement factor shows the highest SMC in comparison with all other within-Malay pattern factors. At the cross-ethnic level of comparison, the magnitude of the SMC

between Chinese School-achievement factor and all other within-Chinese-pattern factors is .227, as against .371 between Malay School-achievement factor and its within-pattern factors.

In summing up, the totality of the above observations point to the sharper differentiation (as indicated by lower correlations between ability-factors) between Chinese School-achievement factor and all other within-Chinese-pattern factors, than between Malay School-achievement factor and all other within-Malay-pattern factors. Hence it may be concluded that the findings support Hypothesis 2.

Testing of Within-Psychosocial Domains Hypothesis.

Hypothesis 3. This expected the variables within each of the three psychosocial domains to pattern differently in the Chinese and Malay samples, though the nature of the difference could not be predicted from the limited information available.

The extent to which the obtained Chinese and Malay factors underlying the variables in the affective, process and status domains agree, will determine whether findings are supportive of this hypothesis.

With respect to the affective domain, three Chinese and Malay factors, interpreted as Acceptance vs Rejection, Psychological Control, and Lax vs Firm Control and identified as equivalent on the basis of high variable loading strengths and high indices of factor similarity have been obtained. Similarly the two factors in the Chinese and Malay process patterns have also been identified to be equivalent and interpreted as Learning Environment and Independence vs Parental School-achievement Motivation. Results on the patterning among the status

variables have revealed that considerable similarity exists across the Chinese and Malay factors. Two clearly equivalent factors, interpreted as Elder's O-E Status and Sibling Size vs Maternal O-E Status exist across the Chinese and Malay promax oblique first-order status patterns. The two remaining Malay status-factors of Paternal O-E Status and Material Index represent the fission products of the Chinese status-factor, Paternal O-E Status + Material Index. Only the Chinese status-factor, Home Induction to School Languages, may be considered to be unrelated to any Malay status-factor. Thus it may be concluded that these findings do not support Hypothesis 3.

## CHAPTER VIII

## ANALYSIS II - BETWEEN-DOMAINS RELATIONS AND HYPOTHESIS TESTING

### Relating Ability Domain and Each of Three Psychosocial Domains

Arising from the existence of some ethnic variations in the factorial compositions of the ability domain and status domain, it was decided that the between-domain relationships should be examined with the ethnic variants included. Measures in the ability and each of the 3 psychosocial domains for each subject were obtained by computing scores on each factor in the associated ethnic pattern. This was carried out by using appropriate quantities in the regression equation below:

$$F = S' R^{-1} Z \qquad \text{(Mulaik, 1972; p. 323)}$$

where $F$ = (nxN) matrix of factor scores
$S$ = (nxr) factor structure matrix
$R$ = (nxn) correlation matrix
$Z$ = (nxN) standardized score matrix
$n$ = number of variables
$r$ = number of factors
and $N$ = number of subjects

For each ethnic sample, inter-domain correlations were computed for each constituent factor in each of these three pairs of inter-domains - ability-affective, ability-process, and ability-status. Table 18 presents the inter-domain correlations for the Chinese sample and Table 19 those for the Malay sample. Two-tailed tests of significance were applied and the level was set at .05. Since the magnitude of the

TABLE 18

INTERCORRELATIONS[a] BETWEEN ABILITY-FACTORS (COLS.) AND AFFECTIVE-FACTORS, STATUS-FACTORS AND PROCESS-FACTORS (ROWS), FOR THE CHINESE SAMPLE (N = 144)

| PSYCHOSOCIAL DOMAINS \ ABILITY DOMAIN | | ABILITY-FACTORS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| AFFECTIVE-FACTORS | 1 | -117 | -093 | -149 | -226* | -158 | -061 | -077 | -075 | -063 |
| | 2 | -000 | -033 | -091 | -075 | -188* | 086 | -106 | -087 | -036 |
| | 3 | 081 | -091 | 109 | 048 | 035 | 098 | 011 | 104 | 133 |
| STATUS-FACTORS | 4 | 037 | 086 | 209* | 174* | 105 | -129 | -057 | 041 | -077 |
| | 5 | 035 | 117 | 103 | 215* | 019 | 135 | -055 | -029 | 020 |
| | 6 | 080 | -076 | 074 | 016 | 103 | -053 | 194* | 092 | 019 |
| | 7 | -031 | 139 | 141 | 157 | 020 | -030 | -200* | 075 | 098 |
| PROCESS-FACTORS | 8 | -005 | -084 | -003 | 114 | -034 | -114 | -172* | -046 | -025 |
| | 9 | 079 | -052 | -048 | 023 | -052 | -014 | -103 | -045 | 028 |

[a]Decimal points omitted

Critical value of r for significance at .05 level = $\pm$ .161

Factor Designations:

| | | |
|---|---|---|
| AFFECTIVE-DOMAIN | 1 - Psychological Control | 1 - Inductive Reasoning I |
| | 2 - Acceptance vs Rejection | 2 - Number facility |
| | 3 - Lax vs Firm Control | 3 - Verbal Reasoning |
| STATUS DOMAIN | 4 - Paternal O-E Status + Material Index | 4 - School-Achievement |
| | 5 - Elder's O-E Status | 5 - Flexibility of Closure |
| | 6 - Sibling Size vs Maternal O-E Status | 6 - Inductive Reasoning II |
| | 7 - Home Induction to School Languages | 7 - Spatial + Visualization |
| PROCESS DOMAIN | 8 - Learning Environment | 8 - RPM AB |
| | 9 - Independence vs Parental School-achievement Motivation | 9 - Speed of Closure |

TABLE 19

INTERCORRELATIONS[a] BETWEEN ABILITY-FACTORS (COLS.) AND AFFECTIVE-FACTORS, STATUS-FACTORS AND PROCESS-FACTORS (ROWS) FOR THE MALAY SAMPLE (N = 166)

| ABILITY-DOMAIN | | ABILITY-FACTORS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PSYCHOSOCIAL DOMAINS | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| AFFECTIVE-FACTORS | 1 | -118 | -119 | -136 | -053 | -014 | 004 | -083 | 089 | 071 |
| | 2 | -004 | 067 | 011 | -037 | -003 | -042 | -006 | -110 | 044 |
| | 3 | -077 | -118 | -188* | 054 | 024 | 064 | -135 | 047 | 155* |
| STATUS-FACTORS | 4 | 031 | 147 | 263* | 119 | 057 | 007 | 060 | -008 | -038 |
| | 5 | 145 | 132 | 262* | 037 | 089 | 113 | 167* | 079 | -045 |
| | 6 | 179* | 011 | -041 | 121 | 076 | 219* | 105 | 065 | 169* |
| | 7 | 172* | 097 | 065 | 205* | 196* | 196* | 123 | 113 | 083 |
| PROCESS-FACTORS | 8 | 059 | 034 | 084 | 014 | -040 | -020 | 114 | 052 | -124 |
| | 9 | -065 | 039 | -064 | 041 | 064 | -046 | 029 | 136 | -093 |

[a]Decimal points omitted

Critical value of r for significance at .05 level = ± .150

Factor Designations:

| | Rows | Columns |
|---|---|---|
| AFFECTIVE-DOMAIN | 1 - Psychological Control | 1 - Inductive Reasoning I |
| | 2 - Lax vs Firm Control | 2 - Inductive Reasoning II |
| | 3 - Acceptance vs Rejection | 3 - School achievement |
| STATUS DOMAIN | 4 - Elder's Occupational + Educational Status | 4 - Number Facility |
| | 5 - Paternal Occupational + Educational Status | 5 - Flexibility of Closure |
| | 6 - Sibling Size vs Maternal O-E Status | 6 - Spatial + Visualization |
| | 7 - Material Index | 7 - Verbal Reasoning |
| PROCESS DOMAIN | 8 - Learning Environment | 8 - Speed of Closure |
| | 9 - Independence vs Parental School-achievement Motivation | 9 - Classification |

across-domain correlations are rather low, the interpretation of these correlations is focussed on the trends of the between-domain relationships rather than on the strengths of those relationships.

Chinese Ability-Affective Relations

Significant negative correlations exist between School-achievement and Psychological Control, and between Flexibility of Closure and Acceptance vs Rejection. Only these two ability-factors are involved in this inter-domain link. The other affective-factor, Lax vs Firm Control appears to have hardly any relationship with ability-factors.

Chinese Ability-Process Relations

The relation between ability-factors and process-factors is a relatively weak one. Only one ability-factor, Spatial + Visualization, shows a significant correlation with Learning Environment (negatively).

Chinese Ability-Status Relations

Three ability-factors (Verbal Reasoning, School-achievement and Spatial + Visualization) show significant correlations with either one or two of the four status-factors. Verbal Reasoning has a relatively high positive correlation with Paternal O-E Status + Material Index. School-achievement relates significantly to Paternal O-E Status + Material Index and Elder's O-E Status. Spatial + Visualization correlates significantly with Sibling Size vs Maternal O-E Status (positively) and Home Induction to School Languages (negatively).

Chinese Relation of Familial Psychosocial Circumstances to Ability-factors

In summing up, the across-domain zero-order correlation results show that 4 out of the 9 ability-factors in the Chinese ability domain are associated with 7 of the total 9 psychosocial-factors in the affective, process, and status domains. These four significantly related ability-factors are School-achievement, Verbal Reasoning, Spatial + Visualization, and Flexibility of Closure. The seven significantly correlated psychosocial-factors include two affective-factors (Psychological Control and Acceptance vs Rejection), one process-factor (Learning Environment), and all the four status-factors. These significantly correlated ability-factors and affective-, process-, and status-factors are extracted from Table 18 and displayed in Table 20.

Malay Ability-Affective Relations

Only the affective-factor, Acceptance vs Rejection appears to have relevance in the inter-domain link for the Malay sample. Acceptance vs Rejection has a significant negative correlation with School-achievement and positive correlation with the Classification factor.

Malay Ability-Process Relations

Clearly there is hardly any substantial association between the process domain and ability domain for the Malay sample.

Malay Ability-Status Relations

In comparison with the Chinese ability-status relations, the link between the ability domain and status domain for the Malay sample

TABLE 20

SIGNIFICANT CORRELATIONS OF ABILITY-FACTORS WITH AFFECTIVE-, PROCESS-, AND STATUS-FACTORS FOR CHINESE AND MALAY SAMPLES

CHINESE

| Ability-Factors | Psychosocial-Factors: Factors | Type | Correlations |
|---|---|---|---|
| School-achievement | Psychological Control | Affective | -.226 |
| | Elder's O-E Status | Status | .215 |
| | Paternal O-E Status + Material Index | Status | .174 |
| Flexibility of Closure | Acceptance vs Rejection | Affective | -.188 |
| Spatial + Visualization | Sibling Size vs Maternal O-E Status | Status | .194 |
| | Home Induction to School Languages | Status | -.200 |
| | Learning Environment | Process | -.172 |
| Verbal Reasoning | Paternal O-E Status + Material Index | Status | .209 |

MALAYS

| Ability-Factors | Psychosocial-Factors: Factors | Type | Correlations |
|---|---|---|---|
| School-achievement | Elder's O-E Status | Status | .263 |
| | Paternal O-E Status | Status | .262 |
| | Acceptance vs Rejection | Affective | -.188 |
| Inductive Reasoning I | Sibling Size vs Maternal O-E Status | Status | .179 |
| | Material Index | Status | .172 |
| Flexibility of Closure | Material Index | Status | .196 |
| Spatial + Visualization | Material Index | Status | .196 |
| | Sibling Size vs Maternal O-E Status | Status | .219 |
| Number Facility | Material Index | Status | .205 |
| Verbal Reasoning | Paternal O-E Status | Status | .167 |
| Classification | Acceptance vs Rejection | Affective | .155 |
| | Sibling Size vs Maternal O-E Status | Status | .169 |

appears to spread over a larger number of ability-factors. Material Index stands out as the one status-factor that shows significant positive correlation with a wider range of ability-factors though all non-verbal, these being Inductive Reasoning I, Number Facility, Flexibility of Closure and Spatial + Visualization. Sibling Size vs Maternal O-E Status also relates significantly with another cluster of non-verbal ability-factors, namely, Inductive Reasoning I, Spatial + Visualization, and Classification. Paternal O-E Status appears to have relevance only for the verbal ability-factors - School-achievement and Verbal Reasoning. Elder's O-E Status supports the Paternal O-E Status in its relation to School-achievement.

Malay Relation of Familial Psychosocial Circumstances to Ability-factors

In summing up the Malay across-domain relations, it may be stated that the link between familial psychosocial circumstances and ability-factors is mediated primarily through the status-factors. No significant correlation occurs in the ability-process relations and only one affective-factor, Acceptance vs Rejection, is involved in the ability-affective relationship. This results in only five significantly related psychosocial-factors, though the across-domain association extends over a larger number of ability-factors. These affected ability-factors include School-achievement, Verbal Reasoning, Inductive Reasoning I, Flexibility of Closure, Number Facility, Spatial + Visualization, and Classification. The significantly correlated ability-factors and affective-, process-, and status-factors are also shown in Table 20,

together with those for the Chinese sample.

Ability-factors Unrelated to Familial Psychosocial Circumstances

Two equivalent Chinese and Malay ability-factors, Inductive Reasoning II (primarily RPM Sets) and Speed of Closure appear to be resistant to familial psychosocial circumstances for both ethnic samples.

Canonical Relations between Contributory Ability-factors and Psychosocial-factors

It is difficult to obtain a clear picture of the 'patterns' of relationship between the significantly correlated ability-factors and psychosocial-factors from a study of the zero-order correlations in Table 18 and Table 19. To examine the 'patterns' of overall maximum association between these ability-factors and psychosocial-factors, a canonical analysis (Mulaik, 1972; Darlington, 1973) was carried out on these two sets of factors for the Chinese and Malay sample separately. Bartlett's statistical test of significance on the canonical correlations (Darlington, 1973; p. 441), gave two canonical variates which may be considered to be significant for the Chinese and Malay samples. Table 21 presents the Chinese results and Table 22 the Malay results.

In interpreting the results in Tables 21 and 22, the correlations between ability-factors or psychosocial-factors with their respective canonical variates are to be considered analogous to loadings in the interpretation of principal component factor analysis results. For this reason, they are referred to as canonical loadings. Positive and negative signs on the loadings are to be regarded in the same sense as similar signs on factor analysis loadings.

TABLE 21

CANONICAL LOADINGS* FOR THE ABILITY-FACTORS AND PSYCHOSOCIAL-FACTORS (CHINESE, N=144)

| Ability-Factors | Canonical Loadings (Correlations bet. Variables and Canonical Variates) I | II | I | II | Psychosocial-Factors |
|---|---|---|---|---|---|
| School-achievement | 819 | -176 | 502 | -073 | Paternal O-E Status + Material Index |
| Verbal Reasoning | 696 | -009 | 471 | -286 | Elder's O-E Status |
| Flexibility of Closure | 552 | 400 | 424 | -623 | Home Induction to School Languages |
| Spatial + Visualization | 074 | 927 | -647 | -159 | Psychological Control |
| | | | -368 | -372 | Acceptance vs Rejection |
| | | | 297 | -530 | Learning Environment |
| | | | 179 | 558 | Sibling Size vs Maternal O-E Status |

$Rc_I = .396$, $p_I = .014$ $Rc_{II} = .356$, $p_{II} = .177$

* Decimal points omitted

TABLE 22

CANONICAL LOADINGS* FOR THE ABILITY-FACTORS AND PSYCHOSOCIAL-FACTORS (MALAYS, N = 166)

| Ability-Factors | Canonical Loadings (Correlations bet. Variables and Canonical Variates) I | II | I | II | Psychosocial-Factors |
|---|---|---|---|---|---|
| School-achievement | 672 | 595 | 475 | 320 | Elder's O-E Status |
| Verbal Reasoning | 205 | 589 | 473 | 631 | Paternal O-E Status |
| Classification | -491 | 245 | -644 | -146 | Acceptance vs Rejection |
| Spatial + Visualization | -305 | 709 | -494 | 627 | Sibling Size vs Maternal O-E Status |
| Number Facility | -204 | 567 | -282 | 657 | Material Index |
| Flexibility of Closure | -104 | 508 | | | |
| Inductive Reasoning I | -014 | 700 | | | |
| $Rc_I = .440$, $p_I = .001$ | | | $Rc_{II} = .353$, $p_{II} = .121$ | | |

* Decimal points omitted

Chinese Ability-Psychosocial Canonical Relations. Two main underlying dimensions are common to both the ability-factors and psychosocial-factors. With respect to the ability-factors, one dimension includes the verbal-educational ability-factors, predominantly School-achievement and Verbal Reasoning and the other dimension represents primarily the spatial-perceptual ability-factors of Spatial + Visualization and Flexibility of Closure. At the level of the first canonical variate, School-achievement, Verbal Reasoning, and Flexibility of Closure are interpreted as relating to the status-factors of Paternal O-E Status + Material Index, Elder's O-E Status, Home Induction to School Languages and Psychological Control. With respect to the second canonical variate, Spatial + Visualization, and Flexibility of Closure are associated positively with Sibling Size vs Maternal O-E Status and negatively with Home Induction to School Languages and Learning Environment.

Malay Ability-Psychosocial Canonical Relations. The 'pattern' of relationships here appears to single out School-achievement as having a particular dimension of relationship over and above the total common relationship that all ability-factors have with the group of psychosocial-factors. Thus, with reference to the first canonical variate, School-achievement vs Classification-Spatial + Visualization is associated with Elder's O-E Status, Paternal O-E Status, Acceptance vs Rejection and Sibling Size vs Maternal O-E Status. The second canonical level of relationship shows that a syndrome of three economically-oriented status-factors, Material Index, Paternal O-E Status, and Sibling Size vs Maternal O-E Status, appears to relate substantially to

almost the whole domain of ability-factors - Spatial + Visualization, Inductive Reasoning I, School-achievement, Verbal Reasoning, Number Facility, and Flexibility of Closure. Thus, with respect to the ability-factors, the Malay first canonical dimension may be viewed as analogous to a bipolar factor, School-achievement vs Spatial-perceptual while the Malay second canonical dimension appears to imply a 'g' factor.

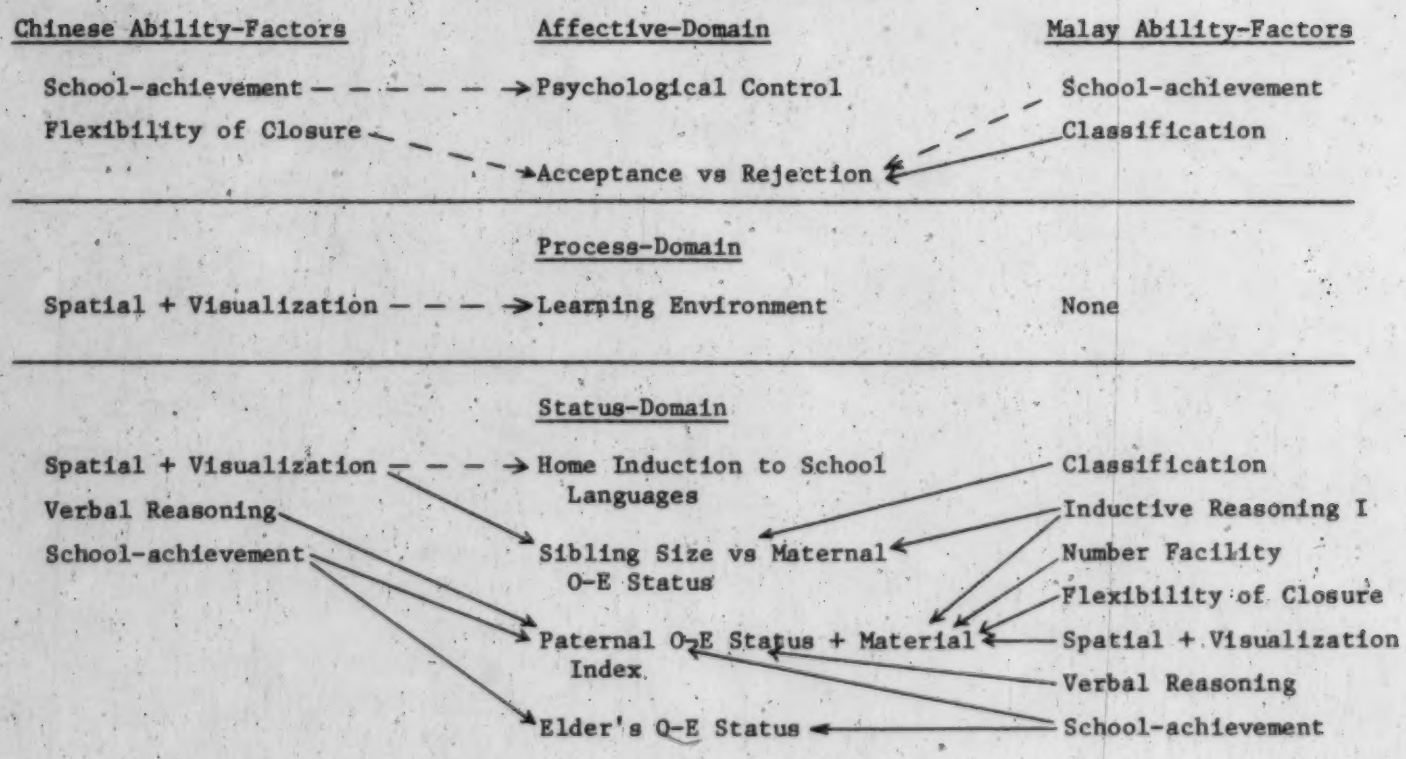
Between-Domain Hypothesis Testing

Hypothesis 4. This expected that relative to the affective and status domains, the process domain would be more closely associated with the School-achievement and Verbal Reasoning factors.

The inter-domain relations for the Chinese and Malay samples, as indicated by significant correlations between domain factors are diagrammatically summarized in Figure 4. It is evident from Figure 4 that there is relatively no substantial relationship between the process domain and the School-achievement, and Verbal Reasoning factors for both the Chinese and Malay samples. In this respect, the findings are incompatible with Hypothesis 4 and hence it has not been supported.

FIGURE 4

SIGNIFICANTLY RELATED ABILITY-FACTORS
AND AFFECTIVE-, PROCESS-, AND STATUS-FACTORS
FOR CHINESE AND MALAY SAMPLES




_ _ _ _ negative correlations

# CHAPTER IX

# SUMMARY, DISCUSSION, AND IMPLICATIONS

## Summary and Discussion of Findings

The two main purposes of this study were: 1a) to investigate the patterns in a domain of school-related elementary ability-factors across two samples of Singapore Chinese and Malay boys of age between 13+ and 14+, with reference to Euro-American defined ability-factors which have been established as relatively stable for schooling subjects, and which are compatible with abilities generally used in Euro-American investigations into the relations of familial psychosocial circumstances to abilities, b), c), and d) to similarly investigate factor patterns in affective, process, and status domains of familial psychosocial circumstances, with reference to those which Euro-American studies have consistently identified as correlates of abilities; and 2) to examine how the ability-factors relate to the affective-, process-, and status-factors. Underlying these two aspects of the study is the overall purpose of investigating the relation of familial psychosocial circumstances to ability-factors under varying conditions of interplay between the home and school in fostering these ability-factors. The findings on these two parts of the study have been presented in the two preceding chapters. This chapter will draw together a summary of these findings and discuss them.

### Within-Domain Patterns

Chinese and Malay Ability-patterns. Seven clearly equivalent

ability-factors and one seemingly similar ability-factor have been identified across the Chinese and Malay patterns of 9 factors each. The remaining unrelated factor in each pattern could not be interpreted psychologically because of their limited number of defining test measures, hence they were named after the main defining test measures. The eight related factors were interpreted as Inductive Reasoning I, Number Facility, Flexibility of Closure, Speed of Closure, Spatial + Visualization, Inductive Reasoning II, Verbal Reasoning, and School-achievement. The hypothesis that the emergent ability-factors for both ethnic samples would resemble the input elementary ability-factors defined by the selected test measures was confirmed though some tests did behave contrary to expectation. Four out of the five input French, Ekstrom, and Price (FEP) elementary ability-factors were reproduced. These reproducible FEP elementary ability-factors of Number Facility, Flexibility of Closure, Speed of Closure, and Spatial + Visualization represented 4 of the 7 in Royce's (1973) list of most stable elementary ability-factors. Though the ability-factors were relatively independent within each ethnic pattern, the factor intercorrelations within the Malay pattern tended to be higher than those within the Chinese pattern. This result is consonant with Ferguson's explanation on the relation between mastery level and differentiation of ability-factors, as shown by the Chinese and Malay differences in performance level on the test measures (Appendix V). The relatively higher SMCs for the School-achievement factor in both Chinese and Malay patterns adds credibility to the original rationale of describing this domain as comprising

school-related abilities. However, there is ethnic variation in the differentiation of School-achievement from the other within-ethnic pattern factors. The hypothesis that Chinese School-achievement factor would exhibit a sharper differentiation from its within-pattern factors than Malay School-achievement factor would, was supported by the result that Chinese School-achievement factor has a within-ethnic pattern SMC rank order of 4 while Malay School-achievement factor has the highest SMC in the Malay pattern. Across-pattern comparison shows that Malay School-achievement has a SMC value of .371, as against Chinese School-achievement factor's value of .227.

These within-ability domain findings appear to be compatible with Euro-American findings. Because of their comparable age range, social class membership and uniformity of exposure to Euro-American type of education, both the Chinese and Malay samples exhibited rather similar ability patterning, and the nature of the emergent factors turned out to match Euro-American defined factors, too. The variation in differentiation of the factors between the Chinese and Malay samples cannot be accounted for by differences in social class membership, age or type of education, as these have been made comparable for both samples. This variation seems to reflect the general observation that the Chinese pupil has a strong motivation for school learning, relative to his Malay counterpart. The Chinese pupils' strong motivation for school learning may be the result of germane Chinese cultural characteristics such as those observed by Hunter (see Section on Samples). This seems to be supported by the lack of ethnic difference in the subjects'

perceptions of parental press for School-achievement (Appendix VII).

Chinese and Malay Affective-patterns. The three original factors that Schaefer's Children's Report of Parent Behaviour Inventory (CRPBI) claimed to tap - Psychological Control, Acceptance vs Rejection, and Lax vs Firm Control, turned out to be equivalent to the three emergent factors in the Chinese and Malay affective-patterns separately. This result has extended the cross-cultural validity of Schaefer's CRPBI to non-Euro-American groups, and suggests that children of contrasting cultural groups describe similar patterns of parental behaviours. The general observation that Chinese parents are stricter in their control of their children appears to be reflected in the significant differences found in scores on the scales between Chinese and Malay subjects' reports of maternal behaviour (Appendix VII).

Chinese and Malay Process-patterns. Two equivalent Chinese and Malay process-factors - Learning Environment and Independence vs Parental School-achievement Motivation represented the factorial constituents of the process domain. The Learning Environment factor appears to concur with the major underlying factor which has consistently emerged within a domain of the Chicago-type of process variables (Dave, 1963; Wolf, 1964b; Dyer, 1967; Marjoribanks, 1970).

Chinese and Malay Status-patterns. Some slight ethnic variation occurred among the four identified status-factors of each ethnic pattern. Two clearly equivalent factors - Elder's Occupational-Educational (O-E) Status and Sibling Size vs Maternal Occupational-Educational Status were identified. The remaining two Malay factors, Paternal

Occupational-Educational Status and Material Index appeared to represent components of the Chinese factor, Paternal Occupational-Educational Status + Material Index. This Chinese Paternal O-E Status + Material Index factor resembles the major factor underlying Dyer's (1967) six status variables of parental education, parental occupation, family income, location of residence, type of residence, and quality of furnishings. The splitting between Malay Paternal O-E Status and Material Index may be attributed to the fact that most of the Malay mothers in this sample were working, though at low occupational status jobs, to supplement the father's income while most of the Chinese mothers were housewives. That the Chinese factor, Home Induction to School Languages, has no Malay parallel may be explained by the fact that for all Malays, one of the school languages is still the home language while this is not the case for the Chinese.

The variable patternings within each ethnic domain appear to reflect the realistic clusterings. In particular, the bipolar factor Sibling Size vs Maternal O-E Status mirrors the current Singapore trend that mothers of high educational and occupational status tend to have a smaller number of children.

The hypothesis that the variable-factors within each domain of affective, process, and status variables would vary across the Chinese and Malay samples was not supported by the findings.

Between-Domain Relations

For both Chinese and Malay samples, the across-domain relations for each of the domain-pairs - ability-affective, ability-process, and

ability-status, appear to be rather weak, as indicated by both the low and few significant intercorrelations. The factors which contribute to significant [redacted] domain relations are represented in Figure 4.

There is ethnic variation in the ability-affective inter-domain relations - the same ability-factor either relates to different affective-factors in the ethnic samples or the same affective factor relates to different ability-factors. For example, School-achievement is associated with Psychological Control in the Chinese case but with Acceptance vs Rejection in the Malay case. At the same time, Acceptance vs Rejection is linked to Flexibility of Closure in the Chinese sample but to School-achievement and Classification in the Malay sample. With respect to the ability-process domain-pair, no relationship exists for the Malay sample, and only Spatial + Visualization relates negatively to Learning Environment in the Chinese sample.

In the ability-status domain-pair, Paternal O-E Status and Elder's O-E Status appear to be of important relevance to School-achievement and Verbal Reasoning for both Chinese and Malay samples. That these two status-factors turned out to be associated with School-achievement is in agreement with the cultural characteristics of these two groups. High Paternal O-E Status with high Elder's O-E Status would mean high family prestige. It will be recalled that through subtle cultural transmission processes, the Chinese or Malay child learns that he has a responsibility to keep up the family image. It follows from this that the responsibility would be more pressing on a child from a high O-E status family and consequently he would be driven to accomplish better

school-achievement . Also fathers and other family members with high O-E status would tend to have more intellectually-oriented values and attitudes which the child might pick and internalise as his own without any conscious or deliberate verbal communication from them. A distinct ethnic contrast occurs with respect to the Material Index factor in the Malay data. This status-factor is associated with a rather large number of non-verbal abilities in the Malay sample, but the Chinese factor of which the Malay Material Index is a component shows no association with any non-verbal ability-factors. This distinctive Malay feature may be attributed to the fact that the availability of mass communication such as radio and T.V. may have greater impact on the more rural-oriented Malay child than the more urban-oriented Chinese child.

The hypothesis that relative to the affective-and status-factors, the process-factors would be more closely associated with the School-achievement factor and Verbal Reasoning factor was found to be incompatible with both Chinese and Malay results. This is in contrast to the stronger link between School-achievement and verbal abilities often found in Euro-American settings (Plowden et al, 1967; Marjoribanks, 1970; Jones, 1972). The Chinese and Malay concurrence on the relations between School-achievement, and Verbal Reasoning and the status- and process-factors is consonant with a main position of this study - that the link between school-fostered ability-factors and the process-factors may be confounded by the counterbalancing effects of the child's own contribution to the school processes of learning.

The significant negative correlation between Chinese School-achievement and Psychological Control, and between Malay School-achievement and Acceptance vs Rejection suggest that the impact of these two broad dimensions of maternal behaviours have different effects on school-achievement for the two samples. It is interesting to note that the Flexibility of Closure factor which include Witkin's Embedded Figures Test, has significant negative correlations with Psychological Control and Acceptance vs Rejection for the Chinese sample. This agrees with Witkin's thesis that too much maternal control negates field-independence, a measure of which is the Group Embedded Figures Test.

The overall relationship between the two sets of significant ability-factors and combined affective-, status-, and process-factors were examined through canonical analysis. For both ethnic samples two underlying dimensions common to the ability-factors and psychosocial-factors were found. With respect to the Chinese sample, the two levels of relationship distinguished the relating ability-factors into the verbal-educational (v:ed) and spatial-perceptual (k:m) abilities. In the case of the Malay sample, School-achievement was distinguished as having a stronger association over and above the total ability-factor link with the relating psychosocial-factors. Both Chinese and Malay results indicated that the link between School-achievement and Paternal O-E Status and Elder's O-E Status constitute the strongest across-domain link. On a cross-ethnic basis, the Malay cross-domain association is stronger than the Chinese, as is indicated by the higher first canonical correlation of the Malays. This was expected on the basis

that the Chinese pupils' greater motivation would lead to greater counterbalancing school effects than would be the case for the Malay child.

Significant Findings of this Study

An overview of the results shows that clear factor patterns within each of the four domains - ability, affective, process and status, have emerged for both Chinese and Malay data. There is considerable factor similarity among corresponding Chinese and Malay patterns. In addition, many of the isolated factors resemble those predicted on the basis of Euro-American findings. The reproducibility of the FEP elementary ability-factors and the Schaefer broad dimensions of parent behaviours are cases in point.

A major finding of this study that does not correspond to those of Euro-American studies is the tenuous across-domain relationship. Very little relationship has been found for both ethnic samples in each of the domain-pairs, -ability-affective, ability-process, and ability-status, as indicated by the low across-domain correlations and canonical correlations. The most predictable ability-factors are School-achievement and Spatial + Visualization, but the main predictors are status factors, namely Paternal O-E Status, Elder's O-E Status and Material Index. No substantial relationship exists between the process-factors and ability-factors.

## Implications

Implications for Theory

The results on the ability patterns of the Chinese and Malay

samples are consonant with results obtained with other non-Euro-American subjects who have been exposed to comparable Euro-American education and acculturation. The reproducibility of the FEP elementary factors of Flexibility of Closure, Speed of Closure, Number Facility, and Spatial + Visualization adds further support for the stability of these factors across diverse cultural groups. While group differences on the patterning of abilities have demonstrated that ability differentiation is inextricably linked with the specific experience the individual encounters in the course of development, the results in this study show that it is also determined by the organism's own contribution to the learning situation. The Chinese and Malay samples have been equated on age, socio-economic class, and type of schooling, but they still differed on the degree of differentiation among the ability-factors which was attributed to their differences in motivational response to school learning.

Instances of some tests, in particular, Letter Sets and Classification, aligning themselves on different factors across the two ethnic patterns indicate that it is misleading to use single tests or groups of tests to represent similar ability-factors across different groups.

The emergence of three equivalent Chinese and Malay affective-factors underlying the scales of the CRPBI - Psychological Control Acceptance vs Rejection, and Lax vs Firm Control, which resemble closely the three dimensions obtained with Euro-American subjects (American subjects by Schaefer and French-Belgian subjects by Renson), extends the cross-cultural validity of the CRPBI to non-Euro-American cultures.

Furthermore, it suggests probable cross-cultural generality in children's organizations of their perceptions of parent behaviours.

Though the Chinese results on the link between the Flexibility of Closure factor and Psychological Control and Acceptance vs Rejection is consonant with Witkin and his colleagues' findings on the relationship between maternal control in child-rearing and field-independence, the cross-cultural generality is questioned by the non-relationship between Flexibility of Closure and any of the affective-factors for the Malay case.

The across-domain relation results suggest that there are two facets of the relationship between familial psychosocial circumstances and ability-factors. One appears to focus more directly on the ability-factors while the other focusses more on the individual as an intermediary . Consider the case of the clear link between the process domain and verbal abilities consistently found in Euro-American studies. In this instance the home practices impinge directly on the individual to draw out the manifestation of the abilities. In the case of the link between School-achievement and the status-factors of Paternal O-E Status and Elder's O-E Status for the Chinese and Malay samples of this study, these status-factors do not provide the stimulating and eliciting environment for the School-achievement factor, but they incite the motivation of the child who being thus armed with a high motivational level was able to respond more optimally to the learning environment of the school. It is this active involvement of the individual that facilitates the emergence of the School-achievement factor.

The findings of this study do not indicate the impotence of familial psychosocial circumstances to ability-factors but draw attention to the fact that the relation of familial psychosocial circumstances to ability-factors has to be viewed in the context of the relative interplay between the home and school. In the Euro-American situation where the school supplements the home in fostering the development of abilities, the relationship between familial psychosocial circumstances and ability-factors has been found to be strong. In the case of these two samples, the tenuous relationship between ability factors and familial psychosocial circumstances reflects the loose links between the home and school in fostering the development of the verbal-educational abilities.

Implications for Practice

A major finding of this study is the weak relationship between familial psychosocial circumstances and ability-factors. This has notable implications for practice in that it points to the potency of schooling. It implies that school effects are much more independent of home circumstances than what have been usually found in Euro-American settings. At a more general level, it indicates that irrespective of the nature of the homes, Euro-American type of education can be implemented in schools. It has a practical value particular to Singapore in that the schools can forge ahead with the task of teaching the skills necessary for the country's growth and advancement towards more sophisticated technology without having to wait for home pressures toward Euro-American type of education to develop.

Another noteworthy implication for practice suggested in this

study is that facet of relationship between familial psychosocial circumstances and ability-factors that provides the individual with the impetus to optimize his own contribution to the learning process. All too often, deficits in opportunities and experiences are more readily compensated for in the school but very little attention has been accorded to motivational deficits. To facilitate his own teaching and improve pupils' mastery level, the teacher should check on the pupils' motivational make-up. For pupils who lack the motivational equipment for learning, greater effort and attention must be directed at inculcating in them the interest and responsibility to learn.

Though the results of this study do not show a strong link between familial psychosocial circumstances and abilities, this should not be interpreted that teachers of rural school children need not design, organize and administer the school learning environment in terms of more enriching and variegated experiences that would widen the horizons of the rural-oriented vistas of the children in their charge. On the contrary, the weak link presents a stronger case for the need to do so.

Parents and teachers should also be cognizant of the fact that too much Psychological Control or over-emphasis on Acceptance vs Rejection appear to have a negative effect on School-achievement. Because there is ethnic variation in the relation of these two affective-factors to School-achievement, Singapore teachers' dealings with Chinese and Malay pupils will have to be adapted to the nature of this variation.

Implications for Research

This study has been conducted on restricted samples of the Chinese and Malay male pupils in Singapore and as such the findings cannot be

generalized to all Singapore Chinese and Malay male pupils. It is probable that the historical socio-cultural differences between the two ethnic groups might have been phased out among the high socio-economic groups and hence findings within these groups would have yielded different results.

More information pertaining to the link between familial psychosocial circumstances and ability-factors may be obtained from studies carried out on female subjects. In Singapore the demarcation between the social roles of the two sexes are not as sharp as those in Euro-American culture, hence the findings on female pupils could reflect this.

The durability of the link between familial psychosocial circumstances to ability-factors with advancing years also needs future investigation. Most Euro-American studies have been carried out with children in the pre-school age period or early years of schooling. Their results have indicated a stronger association between ability-factors and familial psychosocial circumstances than those obtained in this study. This variation in results may be attributed to the age variant, hence there is a need to replicate this study with children of both younger and older age groups.

Another direction that further research can take is to replicate this study with Singapore male pupils of this age group who come from English-speaking homes only, or Chinese male pupils who are receiving the Chinese-medium of education. The outcomes of such studies would provide information to support or challenge the position taken by this study - the relationship between familial psychosocial circumstances and ability-factors depends on the interplay between the home and school.

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# APPENDIX I

## HOME ENVIRONMENT QUESTIONNAIRE

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## HOME ENVIRONMENT QUESTIONNAIRE

### INSTRUCTIONS

I am making a study to find out how pupils' home environments relate to their school achievements and other general skills. I am asking a number of students, including yourself, to give some information about their home environment in this questionnaire.

The information given will not be shown to anyone, and report on any specific pupil will not be made. Please help to make this study a success by giving TRUE answers to all the questions.

"BE SURE TO ANSWER EVERY QUESTION"

NAME: _____

CLASS: _____

SCHOOL: _____

1. How many brothers do you have? (Don't count yourself) _____

2. How many sisters do you have? (Don't count yourself) _____

3. What is your father's occupation? (If he has retired, state his occupation before retirement) _____

4. State the highest educational level your father has attained. (Tick the appropriate space)

____ Post-graduate

____ University degree

____ College diploma (e.g. Ngee Ann, Polytechnic, T.T.C., or equivalent)

____ H.S.C.

____ Cambridge School Certificate

____ Had some secondary education

____ Completed P.S.L.E.

____ Had some primary education

____ Don't know

OTHER ANSWER: _____

5. What is your mother's occupation? (If housewife, state so) _____

6. What is your mother's highest educational level? (Tick the appropriate space)

____ Post-graduate

____ University degree

____ College diploma

____ H.S.C.

____ Cambridge School Certificate

____ Had some secondary education

____ Completed primary education

____ Had some primary education

____ Don't know

OTHER ANSWER: _____

7. What language(s) did you speak before you entered school?
(Tick the space(s) beside the language(s) you could speak then)

____ English

____ Chinese dialect

____ Mandarin

____ Malay

____ Tamil

OTHER ANSWER: _____

8. What type of house do you live in?
(Tick the appropriate space)

____ Compound brick house

____ Semi-detached or terrace house

____ Private apartment

____ HDB flat or equivalent

____ Wooden bungalow house

OTHER ANSWER: _____

9. Do you have to pay rent for your house or flat?

____ Yes

____ No

If Yes, how much? _____
(State amount)

10. How many bedrooms are there in your house or flat? _____
(State the number)

11. Where do you usually do your homework?
(Tick the appropriate space)

____ Study-table in own bedroom

____ Dinner-table

____ Study room, different from bedroom

OTHER ANSWER: _____

12. Do you have a telephone at home?

____ Yes

____ No

13. Is there a radio in your home?

____ Yes

____ No

14. Is there a T.V. in your home?

____ Yes

____ No

15. Is there a refrigerator in your home?

____ Yes

____ No

16a) Do you have a car at home?

____ Yes

____ No

b) How do you go to school?

____ Walk

____ NTUC transport or School Bus

____ Parents send me by car

____ Driven-driven car

OTHER ANSWER: _____

17. Is there any room in your house that is air-conditioned?

____ Yes

____ No

18. Is there an electric fan in your home?

____ Yes

____ No

19. State the educational level of all brothers and sisters older than yourself:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

20. Besides your parents, are there other person(s) working in your home?

____ Yes

____ No

21. If Yes, state (a) the relationship of the person(s) to you, (b) the occupation of the person(s), (c) the highest educational level attained by the person(s) involved, in the following table:

| Relationship | Occupation | Educational Level |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

22. What marks do your parents want you to get in school for most subjects?

____ The highest mark in each subject

____ Above 90%

____ Above 80%

____ Above 70%

____ Above 60%

____ Pass marks would be alright

OTHER ANSWER: _____

23. How often do they tell you that you must do well in school?

____ All the time

____ Once in a while

____ Hardly any

____ Never

OTHER ANSWER: _____

24. In your Primary 6 year, how was your choice of secondary schools made?

____ Your parents made the decision for you

____ Your older brothers/sisters/relatives made the choice for you

____ Your parents talked it over with you and together you agreed on the schools

____ You consulted your older brothers/sisters/relatives and they helped you to decide on the schools

____ You made your own choice

OTHER ANSWER: _____

25. What sort of education would your parents want you to have after this year?

____ Only technical education

____ Only academic education

____ Join the trade schools

____ Any type will do

OTHER ANSWER: _____

26. Did your parents coach you or make special arrangements to make sure that you could pass your P.S.L.E.?

____ Yes

____ No

27. How often do they check on your schoolwork?

____ Every day

____ Once a week

____ Once a month

____ Once in a while

OTHER ANSWER: _____

28a) Do your parents always know about your school examinations?

____ Yes

____ No

b) Usually how do they know about them?

____ They ask you

____ You tell them

c) Do they ask you about how you fare after each examination?

____ Yes

____ No

d) How interested are they about your results?

____ Always ask about them as soon as examinations are over

____ Occasionally ask when the results would be known

____ Never ask anything until the report book is brought home for signature

OTHER ANSWER: _____

29a) Have your parents ever talked to you about what you should do after Sec. IV?

____ Yes

____ No

b) If Yes, what do they want you to do?

____ To go on to Pre-U

____ Take up commercial or technical training

____ Look for a job

OTHER ANSWER: _____

c) Have they ever talked to you about the job you should go into?

____ Yes

____ No

d) If Yes, what do you think they want you to become?

____ salesman
____ mechanic
____ chemist
____ draughtsman
____ bank clerk
____ lawyer
____ doctor
____ dentist
____ engineer
____ typist
____ electrician
____ laboratory assistant
____ primary school teacher
____ hospital assistants/nurses
____ real estate agent
____ secondary school teacher
____ accountant
____ book-keeper

29d) cont'd.

____ architect
____ photographer
____ pharmacist
____ university/college lecturer

OTHER ANSWER: _____

30a) Which of the following hobbies have you ever been involved in doing?

____ stamp-collecting
____ coin-collecting
____ building models
____ drawing
____ photography
____ playing a musical instrument
____ a lot of reading
____ chemistry/electronics
____ learning to play chess
____ working at puzzles

OTHERS: _____

____ Have never been interested in any hobbies

b) In what hobbies or activities are you interested in?

____ stamp-collecting
____ drawing
____ electronics
____ swimming
____ not interested in ANY HOBBY
____ coin-collecting
____ building models
____ chemistry sets
____ a lot of reading

OTHERS: _____
_____

c) Who has got you interested in the hobby?

____ Both parents got you interested
____ Mother
____ Father
____ An older brother/sister/relative got you interested
____ Someone outside the home made you interested
____ Became interested on your own

OTHER ANSWER: _____

31a) List some of the common activities that you often do together with your mother at home:

_____

_____

_____

b) List some of the common activities that you often do together with your father at home:

_____

_____

_____

c) List some of the common activities that you often do together with members of your family other than your parents at home:

_____

_____

_____

32a) Below is a list of places of interest in Singapore. Tick those which you have been to:

| | |
|---|---|
| ____ Haw Par Villa | ____ Van Kleef Acquarium |
| ____ Botanical Gardens | ____ Japanese Gardens |
| ____ National Theatre | ____ Science Centre |
| ____ National Museum | ____ Paya Lebar Airport |
| ____ Jurong Bird Park | ____ Queen Elizabeth Walk |
| ____ Sentosa Island | ____ Chinese Gardens |

OTHERS: _____

b) With whom did you go to these places you have ticked?

____ With family including parents

____ With members of family, but not parents

____ With people outside the family

OTHER ANSWERS: _____

33. During the last school holidays, how many times have you gone on outings (e.g. picnics, camping, etc.)

a) with your parents or other members of your family?

____ A few times

____ Once, because it takes up the whole holiday

____ Just once

____ None

b) with people outside the family?

____ A few times

____ Once, because it takes up the whole holiday

____ Just once

____ None

34a) Do you take any lessons outside school? (e.g. music, art, swimming, sports coaching etc.)

____ Yes

____ No

If Yes, list them here: _____

_____

b) Who suggested that you should take these lessons?

____ Both parents

____ Father

____ Mother

____ A member of family other than parents

____ Someone outside the family

____ Yourself

35a) What do you like to do most when you return home from school?

____ Do your homework, read, study

____ Take courses: music, art, etc.

____ Get involved in your hobby, name the hobby _____

____ Play games outside the house

____ Watch T.V. or listen to the radio

____ Go to school for E.C.A.

OTHER ANSWERS: _____

b) After dinner what to you generally do?

____ Do homework and then read (or just read)

____ Do homework and then get involved with your hobby

____ Read and watch some T.V.

____ Watch T.V. or listen to the radio

OTHER ANSWERS: _____

36a) Do you have a dictionary of your own?

____ Yes

____ No

b) If Yes, what do you use it most often for?

____ Do your English homework

____ Look up new words you come across in your reading

____ Look up words for crossword puzzles or games

____ Bring it to school for English lessons

____ Check meaning of words for English lessons

____ Never use it

OTHER ANSWERS: _____

36c) Are there any dictionaries in your home?

____ Yes

____ No

If Yes, name them _____

_____

d) On the average, how many times a week do you refer to your dictionary?

____ More than 10 times a week

____ About 10 times a week

____ About 5 times a week

____ Once a week

OTHER ANSWERS: _____

e) When did you first have the dictionary?

____ Primary 4 and before

____ Primary 5

____ Primary 6

____ Sec. I

____ This year

OTHER ANSWERS: _____

f) Is this your first dictionary?

____ Yes

____ No

If No, how many more did you have before this one? _____

g) Who first taught you to use the dictionary?

____ Father

____ Mother

____ A member of family other than parents

____ Someone outside the family

____ Found it out yourself

37a) Do you have an enyclopedia in the home?

____ Yes

____ No

b) If Yes, what kind are they? How long have you had them? (Fill in the table below)

| Type of Encyclopedia | Time had them | | | |
|---|---|---|---|---|
| | more than 1 year | 2-3 yrs. | 4-5 yrs. | more than 5 yrs. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

c) How often do you use it to help you in your school work?

____ Very regularly

____ Sometimes

____ Hardly ever

____ Never

d) How often do your parents (or any family member) look at the encyclopedia with you together?

____ About once a week

____ Once a month

37d) cont'd.

____ When we have come across something we want to know more about

____ Never

38a) Does your family subscribe to any magazine (e.g. Time, Newsweek, Her World etc.)?

____ Yes

____ No

____ Don't know

b) If Yes, what are they? _____

_____

c) How often do you read them?

____ Read every issue

____ Read occasionally

____ Never read

39a) What newspaper do you have in the house? (Tick all those you have)

____ Straits Times

____ Berita Hariam

____ Sin Chew Jit Poh

____ Nanyang Siang Pau

____ Tami Murasu

____ New Nation

OTHERS: _____

b) How often do you read the newspapers?

____ Every day

____ Weekends only

39b) cont'd.

____ Once in a while

____ Never read

OTHER ANSWERS: _____

c) Which section(s) of the newspaper interest(s) you most?

____ World news

____ News in Singapore

____ Sports page

____ Cinema page

____ Advertisements

OTHER ANSWERS: _____

d) Who do you talk to most about the things you read in the newspapers?

____ Your parents

____ Members of family other than parents

____ People outside the family

OTHER ANSWERS: _____

e) How often do your parents or any family member give you an article from a newspaper or magazine to read?

____ Nearly every day

____ Once or twice a week

____ Less than once a week

____ Rarely given

____ Never

40a) Are you a member of the National Library or any of its branches?

____ Yes

____ No

b) If Yes, how long have you been a member?

____ Just this year

____ Joined last year

____ Primary 4 and earlier

____ Since Primary 5

____ Since Primary 6

OTHER ANSWERS: _____

c) Who first told you to join the library?

____ Both parents told you about it

____ Father talked to you about it

____ Mother talked to you about it

____ A family member talked to you about it

____ Someone outside the family talked to you about it

____ Can't remember

OTHER ANSWERS: _____

d) What books did you read in the last school holidays?

_____

_____

_____

e) What books did you read last month?

_____

_____

_____

f) Do your parents ever look to see what type of books you are reading?

____ Yes, quite often

____ Sometimes

____ Never

OTHER ANSWERS: _____

g) What percentage of the books you read are written in English?

____ All

____ Most of them

____ About half

____ Less than half

OTHER ANSWERS: _____

h) Do you get your books from other places?

____ Yes

____ No

If Yes, where else do you get them?

____ School library

____ Your parents (family members) buy them for you

____ Church library

____ Borrow from friends

OTHER ANSWERS: _____

41a) About how many hours do you watch T.V. on Saturday and Sunday?

____ Don't watch T.V. on weekends

____ Less than 1 hour each day

____ Between 1 and 3 hours a day (or about 2 hours)

____ Between 4 and 5 hours a day (or a few hours)

____ More than 5 hours a day

41b) How about Monday to Friday? How long do you normally watch it each day?

____ Don't watch T.V. on weekdays

____ Less than 1 hour each day

____ Between 1 and 3 hours each day (or about 2 hours)

____ Between 4 and 5 hours a day (or a few hours)

____ More than 5 hours a day

c) What T.V. programs do you usually watch?

____ Most are educational (news, science documentation, ETV, school debates etc.)

____ All are recreational (movies, sports, musical shows etc.)

____ A mixture of educational and recreational programs

____ Don't know

List the regular programs _____

_____

d) How often do your parents talk about a T.V. program with you after it is over?

____ Quite regularly

____ Occasionally

____ Have discussed only 1 or 2 programs

____ Never had any follow-up discussions

e) What percentage of the programs you watch are in English?

____ 100%

____ Over 50%

____ About 50%

____ Less than 50%

____ None or hardly any

42a) Do your parents know your best friends?

____ Yes, all of them

____ Yes, some of them

____ No

b) If Yes, did your parents ever help you to choose them?

____ Yes, all of them

____ Yes, some of them

____ No (none of them)

43a) Do you ever ask your parents questions about things that puzzle you?

___ Yes

___ No

b) If Yes, what do your parents usually do?

____ Tell you the answers straight away

____ Ask you further questions to make you think out the answer yourself

____ Point out the other instances which makes the answer to your questions obvious to you

____ Tell you to find the answer somewhere

____ Dismiss the questions

OTHER ANSWERS: _____

44a) Do you prefer to spend your time at home with your parents or go out to play with friends?

____ Stay at home with parents

____ Go out to play with friends

b) If you prefer to stay home, what is your parents' reaction to it?

____ Don't mind, haven't discouraged it, encouraged it

44b) cont'd.

____ Quite happy about it but haven't encouraged it

____ Allow it, but would prefer me to play with my friends

____ Try to discourage it

OTHER ANSWERS: _____

45a) Which of the following activities would your parents allow you to do by yourself or with a friend?

| | YES | NO |
|---|---|---|
| sleep at a friend's house overnight | ____ | ____ |
| go on an overnight camping trip | ____ | ____ |
| go to the movies | ____ | ____ |
| go shopping | ____ | ____ |
| go on a picnic or hike | ____ | ____ |
| visit relatives by bus | ____ | ____ |

b) Do your parents allow you to stay alone in the house by yourself at night?

____ Yes

____ No

____ Sometimes

46a) Do you have any pocket money?

____ Yes

____ No

b) If Yes, do your parents always check on how you spend it?

____ Yes

____ No

____ Sometimes

c) When you want to buy something expensive with your own pocket money, do your parents expect you to ask their permission?

____ Yes, mother insists

____ Sometimes would like you to let them know before you purchase it

____ No

OTHER ANSWERS: _____

d) When you have new clothes, how do you usually get them?

____ Your parents just bought them for you

____ You ask your parents for the money and you get them yourself

____ Your parents take you along to the stores and let you make your own choice

OTHER ANSWERS: _____

47a) Do your parents insist that you must let them know whenever you go out with friends or on your own?

____ Yes

____ No

b) If Yes, do you have to tell the time when you would be back?

____ Yes

____ No

c) When you can't return by the expected time, what was your parent's usual reaction?

____ Very worried but relieved when you finally return

____ Quite worried but didn't make a fuss of it

____ Realize that it could happen sometimes

d) When you return home from an outing with friends what do your parents usually do?

____ Ask you to tell them everything

47d) cont'd.

____ Never ask you anything unless you tell them

____ Just ask whether you enjoyed yourself

OTHER ANSWERS: _____

e) When you go to school or go on an outing, who decides what clothes you should wear?

____ Your mother

____ You yourself

____ A family member other than parents

OTHER ANSWERS: _____

48. When you have difficulty with your school work or something else you are doing (e.g. fixing a toy, working on a puzzle), what do your parents usually do when they know it?

____ Offer to do it for you immediately

____ Sit down and help you with it

____ Encourage you to try a new way and watch

____ Leave you to it

____ Tell you to ask someone who knows

49a) Is there somebody else in your family besides your parents whom you admire a lot?

____ Yes

____ No

If Yes, state his or her relation to you here: _____

_____

b) Is there someone outside the family that you admire a lot?

____ Yes

____ No

c) What is it about the person(s) that makes you admire the person?

____ Very clever, has high qualifications

____ Knows a lot of things

____ Can help you in your school work

____ Travels a great deal

____ Has a good job

OTHER ANSWERS: _____

50a) Who would you most like to be like? _____

b) Why? _____

_____

51a) Do your parents ever say that they would like you to be like somebody?

____ Yes

____ No

b) If Yes, say who here: _____

_____

c) What is the person like? _____

_____

52a) Have you read any life-stories of great people in the last term?

____ Yes

____ No

b) If Yes, say who here: _____

53a) Do you get any pocket money regularly each week or each month?

____ Yes

____ No, you ask your parents only when you need to buy something

53a) cont'd.

____ No, you get it occasionally

OTHER ANSWERS: _____

b) What do you usually do with your pocket money when you get it?

____ Spend it immediately you get it and go without money for the rest of the week or month

____ Put some in the POSB and keep some for bus fares, school recess, stationery, etc.

____ Save some for buying something which you like very much, e.g. a watch, pen, clothes, etc.

____ Keep some for buying gifts for members of the family

OTHER ANSWERS: _____

54. If someone gives you $10, what would you do with it?

_____

_____

55a) Do you have a time-table for your own studies at home?

____ Yes

____ No

b) If Yes, how closely do you follow this pattern?

____ Very regularly

____ Regularly except when something unexpected happens

____ Occasionally follow it

____ Follow it only when you feel like studying

OTHER ANSWERS: _____

56a) Do you and your brothers/sisters help with the housework?

____ Yes

____ No

b) If Yes, how is this carried out?

____ Your mother assigns work for each of you

____ Both parents together assign the work

____ You and your brothers and sisters agree among yourselves who should perform certain duties

____ No set rules, when there's work to be done, mother or father just call anyone to do it

____ No set rules, when we (you or your brothers or sisters) feel like helping, we would help

OTHER ANSWERS: _____

57. When do you usually have dinner?

____ Regularly at 6 p.m.

____ Regularly at 7 p.m.

____ Regularly at 7:30 p.m.

____ Anytime after 6 p.m.

____ No fixed time, have dinner when everyone is home

____ Start eating whenever anyone is hungry

OTHER ANSWERS: _____

58. What time do you usually go to bed?

____ Regularly at 9 p.m.

____ Regularly at 9:30 p.m.

____ Regularly at 10:00 p.m.

____ Usually between 10 p.m. - 11 p.m.

____ No fixed time, go to bed whenever you are sleepy or when you've finished your work

OTHER ANSWERS: _____

59a) Did someone read to you before you could read yourself?

____ Yes

____ No

b) If Yes, how often?

____ Every day

____ Nearly every day (3-4 times)

____ A couple of times a week (2 or 3)

____ Less than once a week (or not very often)

OTHER ANSWERS: _____

c) Who used to do the reading?

____ Both parents

____ Mother

____ Father

____ Someone else in the family

OTHER ANSWERS: _____

60a) Do you read to your parents in English?

____ Yes

____ No

b) If Yes, how often?

____ Every day

____ Nearly every day

____ Once or twice a week

____ Less than once a week

OTHER ANSWERS: _____

61a) How often do you speak English at home?

____ All the time

____ Over half the time (most of the time)

____ Half the time

____ Less than half the time

____ Never or hardly ever

b) With whom do you speak English in the home?

____ Father

____ Mother

____ Both parents

____ Brothers and sisters

____ Father, mother, brothers and sisters

OTHER ANSWERS: _____

62. What language is usually spoken at meal time?

____ English

____ Mandarin

____ Malay

____ Tamil

____ Chinese dialect

OTHER ANSWERS: _____

63. Did either of your parents (or somebody else at home) help you to increase your English vocabulary by telling you the meaning of a new word?

____ Every day tells you a new word

____ Nearly every day

____ A couple of times a week

63. cont'd.

____ Once a week

____ Less than once a week

____ Never

64. How often does either of your parents (or someone else in the family) help you with your English grammar (e.g. when to use certain words, how to construct sentences)?

____ Every day

____ Nearly every day

____ A couple of times a week

____ Once a week

____ Less than once a week

____ Never

65. How particular are your parents (or other members of the family) about the way you speak English (good vocabulary, proper grammar, and so on)?

____ Very strict

____ Quite particular

____ Don't care

____ Unable to help

OTHER ANSWERS: _____

# APPENDIX II

## RATING SCHEME FOR HEQ ITEMS

APPENDIX II

RATING SCHEME FOR HEQ ITEMS

1+2-Number of siblings - Score given corresponds to total number given to questions 1 and 2.

3-Father's Occupation - 7 - Higher professional, administrative, or managerial.
6 - Lower professional-executive, school teachers etc.
5 - Skilled artisans (technicians, carpenters, etc.), trades, business.
4 - Clerical, sales.
3 - Highly skilled (manual)
2 - Unskilled workers
1 - Unemployed

4-Father's Education - 7 - Post-graduate
6 - University degree
5 - H.S.C. or college diploma
4 - Cambridge School Certificate
3 - Had some secondary education or completed primary education
2 - Had some primary education
1 - No schooling

5-Mother's Occupation - Same as for Father's.

6-Mother's Education - Same as for Father's.

7-Language before entering school - 7 - English only
5 - English + dialect
3 - School's second language but not English
1 - Dialect only

8-11-Type of house - 7 - Compound brick-house, more than 3 bedrooms, with separate study-room.

6 - Compound brick-house with 3 bedrooms, semi-detached or terrace house with separate study-room.

5 - Any of above type without separate study-room or private apartment with separate study-room.

4 - Private apartment without separate study-room, wooden bungalow house with separate study-room, or HDB 3 bedrooms or more and has separate study-room.

3 - Wooden bungalow house without separate study-room or HDB 3 bedrooms or more without separate study room.

2 - HDB 2 bedrooms.

1 - HDB 1 bedroom.

12-18-Material Wealth - ONE point is given for each of the seven items listed from questions 12-18 inclusive.

19-Highest educational level of sib - The highest educational level listed in this question is rated as has been done for parental education.

20+21-Occupation and education of highest wage earner, not parents - Scores are given as for Father's education and occupation.

22-29Press for achievement:

22) 7 - Highest mark

6 - Above 80%

5 - Above 70%

4 - Above 60%

3 - Above 50%
2 - Pass marks
1 - Whatever marks make no difference

23) 7 - All the time
5 - Once in a while
3 - Hardly any
1 - Never

24) 7 - Parents made the choice
6 - Parents talked over
5 - Older brothers etc. made the choice for you
3 - You consulted your brothers/sisters/relatives
1 - Your own choice

25) 7 - Only academic
6 - Only technical
5 - Only commercial
4 - Academic or technical or commercial
3 - Technical or trade school
2 - Join the trade school
1 - Any type will do

26) 7 - Coach, check every day or once a week
6 - Coach, check once a month

27) 5 - No coach, check every day or once a week
4 - Coach, check once in a while
3 - Coach, no check; No coach, check once a month
2 - No coach, check once in a while
1 - No coach, no check

28) 7 - Yes, ask you, always ask
6 - Yes, ask you, occasionally ask
5 - Yes, ask you, never ask
4 - Yes, you tell them, always ask
3 - Yes, you tell them, occasionally ask

2 - Yes, you tell them, never ask

1 - No, no, never ask

29) 7 - Yes, go to Pre-U, yes, higher professional

6 - Yes, go to Pre-U, no

5 - Yes, go to Pre-U, yes, lower professional

4 - Yes, take up commercial or technical training, yes, lower professional; no, yes, higher professional

3 - Yes, look for a job, yes, clerical

2 - Yes, take up commercial or technical training, no; yes, look for a job, no

1 - No, no

30-35-Press for activeness:

+41

30a) 7 - More than 4 hobbies

6 - 4 hobbies

5 - 3 hobbies

4 - 2 hobbies

3 - 1 thought provoking hobby

2 - Any number, recreational hobbies

1 - Not interested in any hobby

30b) 7 - 3 hobbies or more, both parents

+c) 6 - 3 hobbies or more, 1 parent; or 2 hobbies, both parents

5 - 3 hobbies or more, members of family; or 2 hobbies, 1 parent; or 1 hobby, both parents

4 - 2 hobbies, members of family; or 1 hobby, 1 parent

3 - 1 hobby, members of family; or recreational hobbies, both parents

2 - Interested in hobbies on your own; or recreational hobbies, members of family

1 - Not interested in hobbies

31a) 7 - 3 or more educational activities

6 - 2 educational activities

5 - 2 activities - 1 educational, 1 recreational
4 - 1 educational activity
3 - 2 or more recreational activities
2 - 1 recreational activity
1 - No activity

31b) Same as 31a.

31c) Same as 31a.

32a) 7 - 6 or more with family
+b) 6 - 6 or more with members of family, no parents; or 3-5 with family
5 - 3-5 with members of family, no parents
4 - Less than 3 with family
3 - Less than 3 with members of family, no parents
2 - 6 or more with people outside family
1 - Less than 6 with people outside family

33) 7 - A few times with family
6 - Once because it takes up the whole holiday, with family
5 - Just once, with family
4 - A few times with people outside the family
3 - Once because it takes up the whole holiday, with people outside the family
2 - Just once, with people outside the family
1 - None

34a) 7 - 2 or more extra-curricular and educational courses, both
+b) parents
6 - 2 or more extra-curricular and educational courses, 1 parent; or 1 extra-curricular and educational, both parents
5 - 1 extra curricular and educational, 1 parent; or 2 or more extra-curricular and educational, members of family; or 2 or more extra-curricular and recreational, both parents

4 - 1 extra-curricular and educational, members of family; or 1 extra-curricular and recreational, both parents; or 2 or more extra-curricular and recreational, 1 parent

3 - 2 or more extra-curricular and recreational, members of family; or 1 extra-curricular and recreational, 1 parent

2 - 1 extra-curricular and recreational, members of family

1 - No extra-curricular courses taken

35a) 7 - Take courses or get involved in thought provoking hobbies, +b) do homework and then get involved in hobbies or do homework and then read

6 - Take courses or get involved in thought provoking hobbies, read and watch T.V.

5 - Do homework, read and study, do homework and get involved in hobbies or do homework and then read

4 - Do homework, read and study, read and watch T.V.

3 - Do homework, read and study, watch TV or listen to the radio

2 - Completely recreational, read and watch T.V.

1 - Completely recreational, watch T.V. or listen to radio

41a) 7 - Watch T.V. for educational purposes only

+b) 6 - Doesn't watch T.V. or less than 1 hour, mixed programs

+c) 5 - Weekends only, recreational programs or 1-3 hours, mixed programs

4 - Less than 1 hour, recreational programs or 4-5 hours, mixed programs

3 - 1-3 hours, recreational programs

2 - 4-5 hours, recreational programs or more than 5 hours, mixed programs

1 - More than 5 hours, recreational programs

41d) 7 - Quite regularly

5 - Occasionally

3 - Have discussed 1 or 2 programs

1 - No follow-up discussions

36-40-Press for Intellectuality:

36a) 7 - Additional uses, more than 5 times a week

+b) 6 - Additional uses, 4-5 times a week

+d) 5 - School purposes, more than 5 times a week

4 - Additional uses, 2-3 times a week or school purposes, 4-5 times a week

3 - Additional purposes once a week or school purposes 2-3 times a week

2 - School purposes once a week

1 - No dictionary or has dictionary but never use it

36c) 7 - 3rd dictionary plus 2 or more dictionaries in the home

+f) 6 - 3rd dictionary plus 1 dictionary in the home

5 - 2nd dictionary plus 2 or more dictionary in the home

4 - 2nd dictionary plus 1 dictionary or 3rd dictionary plus no other dictionary in the home

3 - 1st dictionary plus 2 or more dictionaries in the home or 2nd dictionary plus no other dictionary in the home

2 - 1st dictionary plus 1 dictionary in the home

1 - 1st dictionary plus no other dictionary in home or no dictionary but there are other dictionaries in home

36e) 7 - Primary 4 and earlier, either parent

+g) 6 - Primary 4 and earlier, member of family or Primary 5, either parent

5 - Primary 5, member of family or Primary 6, either parent

4 - Primary 6, member of family or Sec. I, either parent

3 - Sec. I, member of family or this year, either parent

2 - Any year, found it out yourself or someone outside family

1 - No dictionary

37) 7 - 2 or more, use regularly, parents once a week since primary education

6 - 2 or more, use regularly, parents once a week since secondary education; 2 or more, use regularly, parents once a

month since primary education; 2 or more, use sometimes, parents once a week since primary education

5 - 1 encyclopedia, use regularly, parents once a week since primary education; 2 or more, use regularly, parents once a month since secondary education; 2 or more, use sometimes, parents once a week or month since secondary education

4 - 1 encyclopedia, use sometimes, parents once a week or month since primary or secondary education; 1 encyclopedia, use regularly, parents never since primary education; 1 encyclopedia, use regularly, parents once a month since secondary education; 2 or more, use regularly or sometimes, parents never since primary or secondary education

3 - 1 encyclopedia, use sometimes, parents once a month or never since primary education or secondary education; 1 encyclopedia, use regularly, parents never since secondary education; 2 or more encyclopedias, use sometimes, parents never since secondary education

2 - 1 encyclopedia, use sometimes, parents never since secondary education

1 - No encyclopedia, never or hardly use

38) 7 - More than 3, all education, read every issue

6 - More than 3, mixed, read every issue; more than 3, all education, read occasionally; 2 educational, read every issue

5 - 1-2 mixed, read every issue; more than 3, mixed, read occasionally; 1 educational, read every issue; 2 educational read occasionally

4 - More than 3, all recreational, read every issue; 1-2 mixed, read occasionally; 1 educational, read occasionally

3 - 1-2 both recreational, read every issue; more than 3, all recreational, read occasionally

2 - 1-2 both recreational, read occasionally

1 - No magazine, or never read

39a) 7 - At least 2 newspapers, all educational, every day
+b) 6 - At least 2 newspapers, mixed, every day; 1 newspaper, all
+c) educational, every day; at least 2 newspapers, all educa-
+40g) tional, once in a while or weekends
+41e) 5 - At least 2 newspapers, mixed, once in a while or weekends;
+61) 1 newspaper, all educational, once in a while or weekends
4 - 1 newspaper, mixed, every day; at least 2 newspapers, all recreational, every day
3 - 1 newspaper, recreational, every day; 1 newspaper, mixed, once in a while or weekends; at least 2 newspapers, all recreational, once in a while or weekends
2 - 1 newspaper, recreational, once in a while or weekends
1 - No newspaper or never read

39d) 7 - Parents, article nearly every day
+e) 6 - Parents, article once or twice a week; members of family, article nearly every day
5 - Parents, less than once a week; members of family, once or twice a week
4 - Parents, once in a while; members of family, less than once a week
3 - Parents or members of family, rarely given
2 - Parents or members of family, never given
1 - Never talk, never given

40a) 7 - Primary 4 and earlier, both parents
+b) 6 - Primary 5, both parents; primary 4 and earlier, one parent
+c) or members of family
5 - Primary 5, one parent or members of family; primary 6, both parents
4 - Primary 6, one parent or members of family; Sec. I, both parents
3 - Since Sec. I, one parent or members of family
2 - Self or people outside family regardless of when
1 - No

40d) 7 - More than 5 books, more than 2 sources, parents often check
+e) 6 - 3-5 books, more than 2 sources, parents often check; more
+f) than 5 books, more than 2 sources, parents sometimes check;
+i) more than 5 books, 1-2 sources, parents often check
5 - 3-5 books, more than 2 sources, parents sometimes check; 3-5 books, 1-2 sources, parents often check; more than 5 books, more than 2 sources, parents never check; more than 5 books, 1-2 sources, parents sometimes check
4 - 3-5 books, 1-2 sources, parents sometimes check; 3-5 books, more than 2 sources, parents never check; less than 3 books, regardless of number of sources, parents often check; more than 5 books, 1-2 sources, parents never check
3 - Less than 3 books, regardless of number of sources, parents sometimes check; 3-5 books, 1-2 sources, parents never check
2 - Less than 3 books, regardless of number of sources, parents never check
1 - No books read

41-48-Press for Independence:

41a) 7 - Parents don't know about boy's friends
+b) 6 - Parents know about some of boy's friends, doesn't choose
+c) for him
5 - Parents know about all boy's friends, doesn't choose for him
4 - Parents know about some of boy's friends, choose some of these for him
3 - Parents know about some of boy's friends, choose these for him
2 - Parents know all boy's friends, choose some for him
1 - Parents know all about boy's friends, choose all for him

42a) 7 - Ask you further questions to make you think out the answer
+b) yourself
6 - Parents point out instances which made the answer clear to you
5 - Tell you to find the answer somewhere

4 - Tell you to ask someone who knows
3 - Tell you the answer straight away
2 - Dismiss the question
1 - No

43a) 7 - Go out to play with friends
+b) 5 - Try to discourage it
4 - Allow it but prefer me to play with friends
2 - Don't mind but haven't encouraged or discouraged it
1 - Quite happy but haven't encouraged it

44a) 7 - All yes
6 - All yes except ii
5 - All yes except i and ii
4 - Yes to iii, iv, v or vi
3 - Yes to iii and vi
2 - Yes to vi only
1 - All no

45) 7 - Yes
4 - Sometimes
1 - No

46a) 7 - No
+b) 4 - Sometimes check
1 - Yes, parents always check or no pocket money

46c) 7 - No
4 - Sometimes
1 - Mother insists or no pocket money

46d) 7 - You ask parents for the money
4 - Parents take you along
1 - Parents bought them for you

47a) 7 - No, no
+b) 5 - Yes, no
+c) 3 - Yes, yes, realize that it could happen

2 - Yes, yes, quite worried but didn't make a fuss about it

1 - Yes, yes, very worried but relieved when you finally return

47d) 7 - Never ask anything, you yourself

+e) 6 - Never ask you anything, family member; just ask how you enjoyed yourself, you yourself

5 - Never ask you, mother; ask you to tell everying, you yourself

4 - Just ask how you enjoy yourself, family member

3 - Just ask how you enjoyed yourself, mother

2 - Ask you to tell everything, family member

1 - Ask you to tell everything, mother

48) 7 - Leave you to it

6 - Encourage you to try a new way and watch

4 - Sit down and help you with it

3 - Tell you to ask someone who knows

2 - Sit down and help you with it

1 - Offer to do it for you immediately

49-52-Model Identification:

49-) 7 - Admiration for a member of family or at least 2 people
52) who have one of these: i) clever, high qualifications ii) good job, iii) extensive knowledge

5 - Parental pressure to be like someone who has i) high qualifications ii) good job iii) extensive knowledge

3 - Read life-stories of at least two great people who have attained great success in their lives

1 - No identification with adult models

53-58-Planfulness in Family:

53-) 7 - Evidence of planning, delayed gratification and regularity
58) shown by answers to all questions

6 - Evidence of planning, delayed gratification and regularity as shown by answers to at least one question in each area

5 - Evidence of any 2 of the 3 areas, shown by positive answers to both questions in these 2

4 - Evidence of any 2 of the 3 areas, shown by positive answers to at least one question in each of these 2

3 - Evidence of 1 of the 3 areas, shown by positive answers to both questions in this one area

2 - Evidence of one positive answer to one of the questions

1 - No planning, immediate gratification, and irregularity

59-65-Press for English:

+39a+40g+41e

59a) 7 - 2 parents, read every day

+b) 6 - 1 parent, read every day; both parents, read nearly

+c) every day

5 - Someone in family, read every day; both parents, read a couple of times a week; 1 parent, read nearly every day

4 - 1 parent, read a couple of times a week; both parents read less than once a week

3 - Someone in family, read a couple of times a week; 1 parent, read less than once a week

2 - Someone in family, read less than once a week

1 - No

60a) 7 - Boy reads every day

+b) 6 - Boy reads nearly every day

4 - Boy reads once or twice a week

3 - Boy reads less than once a week

1 - No

61a) 7 - Speaks English more than half the time, with both parents

+b) or whole family

+c) 6 - Speaks English more than half the time, with 1 parent only

5 - Speaks English more than half the time, with brothers and sisters only

4 - Speaks English half the time, with 1 parent only

3 - Speaks English half the time, with brothers and sisters only

2 - Speaks English half the time

1 - Never or hardly speaks English

39a) 7 - Newspapers all English, books all English, T.V. all English,
+40g) meal-time all English

+41e) 6 - Newspaper all English, Books more than 50% English, T.V.
+62) more than 50% English, meal-time mixed

5 - Newspaper all English, books more than 50% English, T.V. more than 50% English, meal-time mixed; newspaper mixed, books more than 50% English, T.V. more than 50% English, meal-time all English

4 - Newspaper mixed, books more than 50% English, T.V. more than 50% English, meal-time non-English; newspaper non-English, books more than 50% English, T.V. more than 50% English, meal-time mixed

3 - Newspaper non-English, books more than 50% English, T.V. more than 50% English, meal-time non-English; newspaper mixed, books about 50% English, T.V. about 50% English, meal-time non-English

2 - Newspaper non-English, books about 50% English, T.V. about 50% English, meal-time non-English

1 - Newspaper non-English, books less than 50% English, T.V. less than 50% English, meal-time non-English

63) 7 - Every day/nearly every day, very strict

+65) 6 - Every day/nearly every day, quite particular

5 - Couple of times a week/once a week, very strict

4 - Couple of times a week/once a week, quite particular

3 - Less than once a week, very strict

2 - Less than once a week, quite particular

1 - Never, unable to help or don't care

64) Same as above
+65)

# APPENDIX III

## SCHAEFER CHILDREN'S REPORTS OF PARENTAL BEHAVIOUR INVENTORY (CRPBI)

Schaefer Children's Report of
Parental Behaviours Inventory
(Mother Form)

INSTRUCTIONS

We are interested in learning more about the different experiences people have had in their families. We are therefore, asking a number of pupils to report their experiences during childhood.

If you did not grow up with your real mother but someone took her place in your life, please describe that person.

First fill in the personal data sheet on the next page and wait for further directions.

If you are ready, turn to the next page. This is how we are going to answer the statements. I will read out each statement and you follow the words silently as I go along. When I have finished reading, you circle the answer that most clearly describes the way your mother acts toward you. BE SURE TO MARK EACH ITEM BEFORE I READ THE NEXT ITEM.

If you think the item is LIKE your mother, circle (L)

If you think the item is SOMEWHAT LIKE your mother, circle (SL)

If you think the item is NOT LIKE your mother, circle (NL)

## PERSONAL DATA SHEET

NAME _____ SEX _____

SCHOOL _____

CLASS _____

DATE OF BIRTH _____

RACE _____

| Form for Mother | Like | Some-What Like | Not Like |
|---|---|---|---|
| Makes me feel better after talking over my worries with her. | L | SL | NL |
| Likes to talk to me and be with me much of the time. | L | SL | NL |
| Isn't very patient with me. | L | SL | NL |
| Sees to it that I know exactly what I may or may not do. | L | SL | NL |
| Says I'm very good natured. | L | SL | NL |
| Wants to know exactly where I am and what I am doing. | L | SL | NL |
| Decides what friends I can go around with. | L | SL | NL |
| Soon forgets a rule she has made. | L | SL | NL |
| Doesn't mind if I kid her about things. | L | SL | NL |
| Is easy with me. | L | SL | NL |
| Doesn't talk with me very much. | L | SL | NL |
| Will not talk to me when I displease her. | L | SL | NL |
| Seems to see my good points more than my faults. | L | SL | NL |
| Doesn't let me go places because something might happen to me. | L | SL | NL |
| Thinks my ideas are silly. | L | SL | NL |
| Is very strict with me. | L | SL | NL |
| Tells me I'm good looking. | L | SL | NL |
| Feels hurt when I don't follow advice. | L | SL | NL |
| Is always telling me how I should behave. | L | SL | NL |
| Usually doesn't find out about my misbehavior. | L | SL | NL |
| Enjoys it when I bring friends to my home. | L | SL | NL |
| Worries about how I will turn out, because she takes anything bad I do seriously. | L | SL | NL |
| Spends very little time with me. | L | SL | NL |
| Allows me to go out as often as I please. | L | SL | NL |
| Almost always speaks to me with a warm and friendly voice. | L | SL | NL |
| Is always thinking of things that will please me. | L | SL | NL |
| Says I'm a big problem. | L | SL | NL |
| Believes in having a lot of rules and sticking to them. | L | SL | NL |
| Tells me how much she loves me. | L | SL | NL |
| Is always checking on what I've been doing at school or at play. | L | SL | NL |
| Keeps reminding me about things I am not allowed to do. | L | SL | NL |
| Punishes me for doing something one day, but ignores it the next. | L | SL | NL |
| Allows me to tell her if I think my ideas are better than hers. | L | SL | NL |
| Lets me off easy when I do something wrong. | L | SL | NL |
| Almost never brings me a surprise or present. | L | SL | NL |

| Form for Mother | Like | Some-What Like | Not Like |
|---|---|---|---|
| Sometimes when she disapproves, doesn't say anything but is cold and distant for a while. | L | SL | NL |
| Understands my problems and my worries. | L | SL | NL |
| Seems to regret that I am growing up and am spending more time away from home. | L | SL | NL |
| Forgets to help me when I need it. | L | SL | NL |
| Sticks to a rule instead of allowing a lot of exceptions. | L | SL | NL |
| Likes to talk about what she has read with me. | L | SL | NL |
| Thinks I'm not grateful when I don't obey. | L | SL | NL |
| Tells me exactly how to do my work. | L | SL | NL |
| Doesn't pay much attention to my misbehavior. | L | SL | NL |
| Likes me to choose my own way to do things. | L | SL | NL |
| If I break a promise, doesn't trust me again for a long time. | L | SL | NL |
| Doesn't seem to think of me very often. | L | SL | NL |
| Doesn't tell me what time to be home when I go out. | L | SL | NL |
| Enjoys talking things over with me. | L | SL | NL |
| Gives me a lot of care and attention. | L | SL | NL |
| Sometimes wishes she didn't have any children. | L | SL | NL |
| Believes that all my bad behavior should be punished in some way. | L | SL | NL |
| Hugs and kisses me often. | L | SL | NL |
| Asks me to tell everything that happens when I'm away from home. | L | SL | NL |
| Doesn't forget very quickly the things I do wrong. | L | SL | NL |
| Wants me to tell her about it if I don't like the way she treats me. | L | SL | NL |
| Can't say no to anything I want. | L | SL | NL |
| Thinks I am just someone to "put up with". | L | SL | NL |
| Speaks to me in a cold, matter-of-fact voice when I offend her. | L | SL | NL |
| Enjoys going on drives, trips or visits with me. | L | SL | NL |
| Worries about me when I'm away. | L | SL | NL |
| Forgets to get me things I need. | L | SL | NL |
| Gives hard punishments. | L | SL | NL |
| Believes in showing her love for me. | L | SL | NL |
| Feels hurt by the things I do. | L | SL | NL |
| Tells me how to spend my free time. | L | SL | NL |
| Doesn't insist that I do my homework. | L | SL | NL |
| Lets me help to decide how to do things we're working on. | L | SL | NL |
| Says some day I'll be punished for my bad behavior. | L | SL | NL |
| Sometimes allows me to do things that she says are wrong. | L | SL | NL |

| Form for Mother | Like | Some-What Like | Not Like |
|---|---|---|---|
| Doesn't seem to enjoy doing things with me. | L | SL | NL |
| Gives me as much freedom as I want. | L | SL | NL |
| Smiles at me very often. | L | SL | NL |
| Often gives up something to get something for me. | L | SL | NL |
| Is always getting after me. | L | SL | NL |
| Sees to it that I'm on time coming home from school or for meals. | L | SL | NL |
| Tries to treat me as an equal. | L | SL | NL |
| Keeps a careful check on me to make sure I have the right kind of friends. | L | SL | NL |
| Keeps after me about finishing my work. | L | SL | NL |
| Depends upon her mood whether a rule is enforced or not. | L | SL | NL |
| Makes me feel free when I'm with her. | L | SL | NL |
| Excuses my bad conduct. | L | SL | NL |
| Doesn't show that she loves me. | L | SL | NL |
| Is less friendly with me if I don't see things her way. | L | SL | NL |
| Is able to make me feel better when I am upset. | L | SL | NL |
| Becomes very involved in my life. | L | SL | NL |
| Almost always complains about what I do. | L | SL | NL |
| Punishes me when I don't obey. | L | SL | NL |
| Always listens to my ideas and opinions. | L | SL | NL |
| Tells me how much she has suffered for me. | L | SL | NL |
| Would like to be able to tell me what to do all the time. | L | SL | NL |
| Doesn't check up to see whether I have done what she told me. | L | SL | NL |
| Asks me what I think about how we should do things. | L | SL | NL |
| Thinks and talks about my misbehavior long after it's over. | L | SL | NL |
| Doesn't share many activities with me. | L | SL | NL |
| Lets me go any place I please without asking. | L | SL | NL |
| Enjoys doing things with me. | L | SL | NL |
| Makes me feel like the most important person in her life. | L | SL | NL |
| Gets cross and angry about little things I do. | L | SL | NL |
| Believes in punishing me to correct and improve my manners. | L | SL | NL |
| Often has long talks with me about the causes and reasons for things. | L | SL | NL |
| Wants to know with whom I've been when I've been out. | L | SL | NL |
| Is unhappy that I'm not better in school than I am. | L | SL | NL |
| Only keeps rules when it suits her. | L | SL | NL |

| Form for Mother | Like | Some-What Like | Not Like |
|---|---|---|---|
| Really wants me to tell her just how I feel about things. | L | SL | NL |
| Lets me stay up late if I keep asking. | L | SL | NL |
| Almost never goes on Sunday drives or picnics with me. | L | SL | NL |
| Will avoid looking at me when I've disappointed her. | L | SL | NL |
| Enjoys working with me in the house or yard. | L | SL | NL |
| Usually makes me the centre of her attention at home. | L | SL | NL |
| Often blows her top when I bother her. | L | SL | NL |
| Almost always punishes me in some way when I am bad. | L | SL | NL |
| Often praises me. | L | SL | NL |
| Says if I loved her, I'd do what she wants me to do. | L | SL | NL |
| Gets cross and nervous when I'm noisy around the house. | L | SL | NL |
| Seldom insists that I do anything. | L | SL | NL |
| Tries to understand how I see things. | L | SL | NL |
| Says that some day I'll be sorry that I wasn't better as a child. | L | SL | NL |
| Complains that I get on her nerves. | L | SL | NL |
| Lets me dress in any way I please. | L | SL | NL |
| Comforts me when I'm afraid. | L | SL | NL |
| Enjoys staying at home with me more than going out with friends. | L | SL | NL |
| Doesn't work with me. | L | SL | NL |
| Insists that I must do exactly as I'm told. | L | SL | NL |
| Encourages me to read. | L | SL | NL |
| Asks other people what I do away from home. | L | SL | NL |
| Loses her temper with me when I don't help around the house. | L | SL | NL |
| Frequently changes the rules I am supposed to follow. | L | SL | NL |
| Allows me to have friends at my home often. | L | SL | NL |
| Does not insist I obey if I complain or protest. | L | SL | NL |
| Hardly notices when I am good at home or in school. | L | SL | NL |
| If I take someone else's side in an argument, is cold and distant to me. | L | SL | NL |
| Cheers me up when I am sad. | L | SL | NL |
| Does not approve of my spending a lot of time away from home. | L | SL | NL |
| Doesn't get me things unless I ask over and over again. | L | SL | NL |

| Form for Mother | Like | Some-What Like | Not Like |
|---|---|---|---|
| Sees to it that I obey when she tells me something. | L | SL | NL |
| Tells me where to find out more about things I want to know. | L | SL | NL |
| Tells me of all the things she has done for me. | L | SL | NL |
| Wants to control whatever I do. | L | SL | NL |
| Does not bother to enforce rules. | L | SL | NL |
| Makes me feel at ease when I'm with her. | L | SL | NL |
| Thinks that any misbehavior is very serious and will have future consequences. | L | SL | NL |
| Is always finding fault with me. | L | SL | NL |
| Allows me to spend my money in any way I like. | L | SL | NL |
| Often speaks of the good things I do. | L | SL | NL |
| Makes her whole life center about her children. | L | SL | NL |
| Doesn't seem to know what I need or want. | L | SL | NL |
| Sees to it that I keep my clothes neat, clean, and in order. | L | SL | NL |
| Is happy to see me when I come from school or play. | L | SL | NL |
| Questions me in detail about what my friends and I discuss. | L | SL | NL |
| Doesn't give me any peace until I do what she says. | L | SL | NL |
| Insists I follow a rule one day and then forgets about it the next. | L | SL | NL |
| Gives me the choice of what to do whenever possible. | L | SL | NL |
| I can talk her out of an order, if I complain. | L | SL | NL |
| Often makes fun of me. | L | SL | NL |
| If I've hurt her feelings, stops talking to me until I please her again. | L | SL | NL |
| Has a good time at home with me. | L | SL | NL |
| Worries that I can't take care of myself unless she is around. | L | SL | NL |
| Acts as though I'm in the way. | L | SL | NL |
| If I do the least little thing that I shouldn't, punishes me. | L | SL | NL |
| Hugged or kissed me goodnight when I was small. | L | SL | NL |
| Says if I really cared for her, I would not do things that cause her to worry. | L | SL | NL |
| Is always trying to change me. | L | SL | NL |
| Lets me get away without doing work I had been given to do. | L | SL | NL |
| Is easy to talk to. | L | SL | NL |
| Says that sooner or later we always pay for bad behavior. | L | SL | NL |
| Wishes I were a different kind of person. | L | SL | NL |

| Form for Mother | Like | Some-What Like | Not Like |
|---|---|---|---|
| Lets me go out any evening I want. | L | SL | NL |
| Seems proud of the things I do. | L | SL | NL |
| Spends almost all of her free time wit her children. | L | SL | NL |
| Tells me to quit "hanging around the house' and go somewhere. | L | SL | NL |
| I have certain jobs to do and am not allowed to do anything else until they are done. | L | SL | NL |
| Is very interested in what I am learning at school. | L | SL | NL |
| Almost always wants to know who phoned me or wrote to me and what they said. | L | SL | NL |
| Doesn't like the way I act at home. | L | SL | NL |
| Changes her mind to make things easier for herself. | L | SL | NL |
| Lets me do things that other children my age do. | L | SL | NL |
| Can be talked into things easily. | L | SL | NL |
| Often seems glad to get away from me for a while. | L | SL | NL |
| When I upset her, won't have anything to do with me until I find a way to make up. | L | SL | NL |
| Isn't interested in changing me, but likes me as I am. | L | SL | NL |
| Wishes I would stay at home where she could take care of me. | L | SL | NL |
| Makes me feel I'm not loved. | L | SL | NL |
| Has more rules than I can remember, so is often punishing me. | L | SL | NL |
| Says I make her happy. | L | SL | NL |
| When I don't do as she wants, says I'm not grateful for all she has done for me. | L | SL | NL |
| Doesn't let me decide things for myself. | L | SL | NL |
| Lets me get away with a lot of things. | L | SL | NL |
| Tries to be a friend rather than a boss. | L | SL | NL |
| Will talk to me again and again about anything bad I do. | L | SL | NL |
| Is never interested in meeting or talking with my friends. | L | SL | NL |
| Lets me do anything I like to do. | L | SL | NL |

# APPENDIX III

## CRPBI SCALES AND THEIR CORRESPONDING ITEMS

1. ACCEPTANCE

1.1 Makes me feel better after talking over my worries with her.
1.2 Seems to see my good points more than my faults.
1.3 Almost always speaks to me with a warm and friendly voice.
1.4 Understands my problems and my worries.
1.5 Enjoys talking things over with me.
1.6 Enjoys going on drives, trips or visits with me.
1.7 Smiles at me very often.
1.8 Is able to make me feel better when I'm upset.
1.9 Enjoys doing things with me.
1.10 Enjoys working with me in the house or yard.
1.11 Comforts me when I'm afraid.
1.12 Cheers me up when I'm sad.
1.13 Often speaks of the good things I do.
1.14 Has a good time at home with me.
1.15 Seems proud of the things I do.
1.16 Isn't interested in changing me, but likes me as I am.

2. CHILDCENTREDNESS

2.1 Likes to talk to me and be with me much of the time.
2.2 Is always thinking of things that will please me.
2.3 Gives me a lot of care and attention.
2.4 Often gives up something to get something for me.
2.5 Makes me feel like the most important person in her life.
2.6 Enjoys staying at home with me more than going out with friends.
2.7 Makes her whole life centre about her children.
2.8 Spends almost all her free time with her children.

3. POSSESSIVENESS

3.1 Doesn't let me go places because something might happen to me.
3.2 Seems to regret that I am growing up and am staying more time away from home.
3.3 Worries about me when I'm away.
3.4 Becomes very involved in my life.
3.5 Usually makes me the centre of her attention at home.
3.6 Does not approve of my spending a lot of time away from home.
3.7 Worries that I can't take care of myself unless she is around.
3.8 Wishes I would stay at home where she could take care of me.

4. REJECTION

4.1 Isn't very patient with me.
4.2 Thinks my ideas are silly.
4.3 Says that I'm a big problem.
4.4 Forgets to help me when I need it.
4.5 Sometimes wishes that she didn't have any children.
4.6 Forgets to get me things I need.
4.7 Is always getting after me.
4.8 Almost always complains about what I do.
4.9 Gets cross and angry about little things I do.
4.10 Often blows her top when I bother her.
4.11 Doesn't work with me.
4.12 Doesn't get me things unless I ask over and over again.
4.13 Doesn't seem to know what I need or want.
4.14 Acts as though I'm in the way.
4.15 Tells me to quit "hanging around the house" and go somewhere.
4.16 Makes me feel I'm not loved.

5. CONTROL

5.1 Sees to it that I know exactly what I may or may not do.
5.2 Believes in having a lot of rules and sticking to them.
5.3 Believes that all my bad behaviour should be punished in some way.
5.4 Sees to it that I'm on time coming home from school or for meals.
5.5 Believes in punishing me to correct and improve my manners.
5.6 Insists that I must do as I'm told.
5.7 Sees to it that I keep my clothes neat, clean, and in order.
5.8 I have certain jobs to do and am not allowed to do anything else until they are done.

6. ENFORCEMENT

6.1 Is very strict with me.
6.2 Sticks to a rule instead of allowing a lot of exceptions.
6.3 Gives hard punishments.
6.4 Punishes me when I don't obey.
6.5 Almost always punishes me in some way when I am bad.
6.6 Sees to it that I obey when she tells me something.
6.7 If I do the least little thing that I shouldn't, punishes me.
6.8 Has more rules than I can remember, so is often punishing me.

7. POSITIVE INVOLVEMENT

7.1 Says that I'm very good natured.
7.2 Tells me I'm good looking.
7.3 Tells me how much she loves.

7.4 Likes to talk about what she has read with me.
7.5 Hugs and kisses me often.
7.6 Believes in showing her love to me.
7.7 Tries to treat me as an equal.
7.8 Always listens to my ideas and opinions.
7.9 Often has long talks with me about the causes and reasons for things.
7.10 Often praises me.
7.11 Encourages me to read.
7.12 Tells me where to find out more about things I want to know.
7.13 Is happy to see me when I come home from school or play.
7.14 Hugged and kissed me goodnight when I was small.
7.15 Is very interested in what I am learning at school.
7.16 Says I make her happy.

8. INTRUSIVENESS

8.1 Wants to know exactly where I am and what I am doing.
8.2 Is always checking on what I've been doing at school or at play.
8.3 Asks me to tell everything that happens when I'm away from home.
8.4 Keeps a careful check on me to make sure I have the right kind of friends.
8.5 Wants to know with whom I've been when I've been out.
8.6 Asks other people what I do away from home.
8.7 Questions me in detail about what my friends and I discuss.
8.8 Almost always wants to know who phoned or wrote to me and what they said.

9. CONTROL THROUGH GUILT

9.1 Feels hurt when I don't follow advice.
9.2 Thinks I'm not grateful when I don't obey.
9.3 Feels hurt by the things I do.
9.4 Tells me how much she has suffered for me.
9.5 Says if I loved her, I'd do what she wants me to do.
9.6 Tells me of all the things she has done for me.
9.7 Says if I really cared for her, I would not do things that cause her to worry.
9.8 When I don't do as she wants, says I'm not grateful for all she has done for me.

10. HOSTILE CONTROL

10.1 Decides what friends I can go around with.
10.2 Is always telling me how I should behave.
10.3 Keeps reminding me about things I am not allowed to do.
10.4 Tells me exactly how to do my work.
10.5 Doesn't forget very easily the things I do wrong.

10.6 Tells me how to spend my free time.
10.7 Keeps after me about finishing my work.
10.8 Would like to be able to tell me what to do all the time.
10.9 Is unhappy that I'm not better in school than I am.
10.10 Gets cross and nervous when I'm noisy around the house.
10.11 Loses her temper with me when I don't help around the house.
10.12 Wants to control whatever I do.
10.13 Doesn't give me any peace until I do what she says.
10.14 Is always trying to change me.
10.15 Doesn't like the way I act at home.
10.16 Doesn't let me decide things for myself.

11. INCONSISTENT DISCIPLINE

11.1 Soon forgets a rule she has made.
11.2 Punishes me for doing something one day, but ignores it the next.
11.3 Sometimes allows me to do things that she says are wrong.
11.4 Depends upon her mood whether a rule is enforced or not.
11.5 Only keeps rules when it suits her.
11.6 Frequently changes the rules I am supposed to follow.
11.7 Insists I follow a rule one day and then forgets about it the next.
11.8 Changes her mind to make things easier for herself.

12. NONENFORCEMENT

12.1 Usually doesn't find out about my misbehaviour.
12.2 Doesn't pay much attention to my misbehaviour.
12.3 Doesn't insist that I do my homework.
12.4 Doesn't check up to see whether I have done what she told me.
12.5 Seldom insists that I do anything.
12.6 Does not bother to enforce rules.
12.7 Lets me get away without doing work I had been given to do.
12.8 Lets me get away with a lot of things.

13. ACCEPTANCE OF INDIVIDUATION

13.1 Doesn't mind if I kid her about things.
13.2 Enjoys it when I bring friends to my home.
13.3 Allows me to tell her if I think my ideas are better than hers.
13.4 Likes me to choose my own way to do things.
13.5 Wants me to tell her about it if I don't like the way she treats me.
13.6 Lets me decide how to do things we're working on.
13.7 Makes me feel free when I'm with her.
13.8 Asks me what I think about how we should do things.
13.9 Really wants me to tell her just how I feel about things.
13.10 Tries to understand how I see things.

13.11 Allows me to have friends at my home often.
13.12 Makes me feel at ease when I'm with her.
13.13 Gives me the choice of what to do whenever possible.
13.14 Is easy to talk to.
13.15 Lets me do things that children my age do.
13.16 Tries to be a friend rather than a boss.

14. LAX DISCIPLINE

14.1 Is easy with me.
14.2 Lets me off easy when I do something wrong.
14.3 Can't say no to anything I want.
14.4 Excuses my bad conduct.
14.5 Lets me stay up late if I keep asking.
14.6 Does not insist I obey if I complain or protest.
14.7 I can talk her out of an order, if I complain.
14.8 Can be talked into things easily.

15. INSTILLING PERSISTENT ANXIETY

15.1 Worries about how I will turn out, because she takes anything bad I do seriously.
15.2 If I break a promise, doesn't trust me again for a long time.
15.3 Says some day I'll be punished for my bad behaviour.
15.4 Thinks and talks about my misbehaviour long after its over.
15.5 Says that some day I'll be sorry that I wasn't better as a child.
15.6 Thinks that any misbehaviour is very serious and will have future consequences.
15.7 Says that sooner or later we always pay for bad behaviour.
15.8 Will talk to me again and again about anything bad I do.

16. HOSTILE DETACHMENT

16.1 Doesn't talk with me very much.
16.2 Spends very little time with me.
16.3 Almost never brings me a surprise or present.
16.4 Doesn't seem to think of me very often.
16.5 Thinks that I am just someone to "put up with".
16.6 Doesn't seem to enjoy doing things with me.
16.7 Doesn't show that she loves me.
16.8 Doesn't share many activities with me.
16.9 Almost never goes on Sunday drives or picnics with me.
16.10 Complains that I get on her nerves.
16.11 Hardly notices when I'm good at home or in school.
16.12 Is always finding fault with me.
16.13 Often makes fun of me.
16.14 Wishes I were a different kind of person.

16.15 Often seems glad to get away from me for a while.
16.16 Is never interested in meeting or talking with my friends.

17. WITHDRAWAL OF RELATIONS

17.1 Will not talk to me when I displease her.
17.2 Sometimes when she disapproves, doesn't say anything but is cold and distant for a while.
17.3 Speaks to me in a cold, matter-of-fact voice when I offend her.
17.4 Is less friendly with me if I don't see things her way.
17.5 Will avoid looking at me when I've disappointed her.
17.6 If I take someone else's side in an argument, is cold and distant to me.
17.7 If I've hurt her feelings, stops talking to me until I please her again.
17.8 When I upset her, won't have anything to do with me until I find a way to make up.

18. EXTREME AUTONOMY

18.1 Allows me to go out as often as I please.
18.2 Doesn't tell me what time to be home when I go out.
18.3 Gives me as much freedom as I want.
18.4 Lets me go any place I please without asking.
18.5 Lets me dress in any way I please.
18.6 Allows me to spend my money in any way I like.
18.7 Lets me out any evening I want.
18.8 Lets me do anything I like to do.

SCORING SHEET FOR THE CHILD'S REPORT OF PARENT BEHAVIOR INVENTORY Case No.

To score: Assign the value 3 to L, 2 to SL and 1 to NL, and score in sequential order down the columns

| Check one: ( ) Father (✓) Mother | Page 1 | Page 2 | Page 3 | Page 4 | Page 5 | Page 6 | TOTAL |
|---|---|---|---|---|---|---|---|
| 1. Acceptance | | | | | | | |
| 2. Childcentredness | | | | | | | |
| 3. Possessiveness | | | | | | | |
| 4. Rejection | | | | | | | |
| 5. Control | | | | | | | |
| 6. Enforcement | | | | | | | |
| 7. Positive Involvement | | | | | | | |
| 8. Intrusiveness | | | | | | | |
| 9. Control through Guilt | | | | | | | |
| 10. Hostile Control | | | | | | | |
| 11. Inconsistent Discipline | | | | | | | |
| 12. Nonenforcement | | | | | | | |
| 13. Acceptance of Individuation | | | | | | | |
| 14. Lax Discipline | | | | | | | |
| 15. Instilling Persistent Anxiety | | | | | | | |
| 16. Hostile Detachment | | | | | | | |
| 17. Withdrawal of Relations | | | | | | | |
| 18. Extreme Autonomy | | | | | | | |

## APPENDIX IV

## LIST OF PARTICIPATING SCHOOLS

# APPENDIX IV

## PARTICIPATING SCHOOLS IN PILOT AND MAIN STUDIES

Participating Schools in Pilot Testing:

1. Broadrick Secondary School
2. Gan Eng Seng Secondary School
3. St. Andrew's Secondary School

Participating Schools in Main Study:

1. Maju Secondary School
2. Sekolah Menengah Tun Sri Lanang
3. Swiss Cottage Secondary School
4. Yusof Ishak Secondary School

# APPENDIX V

## MEANS AND STANDARD DEVIATIONS OF ABILITY MEASURES FOR CHINESE AND MALAY SAMPLES

## APPENDIX V

### MEANS AND STANDARD DEVIATIONS OF ABILITY MEASURES FOR CHINESE AND MALAY SAMPLES

| Ability Measures | CHINESE | | MALAYS | |
|---|---|---|---|---|
| | MEANS | S.Ds. | MEANS | S.Ds. |
| 1. Directions | 3.14 | 1.73 | 1.94 | 1.41 |
| 2. Verbal Opposites | 6.07 | 2.04 | 4.84 | 1.65 |
| 3. Numerical Series | 4.75 | 1.83 | 3.36 | 1.54 |
| 4. Verbal Analogies | 3.24 | 1.46 | 2.71 | 1.26 |
| 5. Simple Arithmetic Computation | 2.87 | 2.02 | 1.65 | 1.62 |
| 6. Synonyms | 3.82 | 1.88 | 2.92 | 1.60 |
| 7. Analogies | 6.29 | 2.48 | 4.69 | 2.10 |
| 8. Sames | 7.92 | 3.08 | 6.05 | 2.86 |
| 9. Subtractions | 6.57 | 2.70 | 4.56 | 2.60 |
| 10. Series | 7.61 | 2.70 | 5.46 | 2.53 |
| 11. Superimpositions | 6.10 | 2.68 | 4.60 | 2.38 |
| 12. Reading | 35.41 | 7.50 | 27.93 | 7.34 |
| 13. Mathematics | 26.99 | 9.90 | 12.59 | 7.51 |
| 14. Science | 27.29 | 9.91 | 13.89 | 7.79 |
| 15. Addition | 38.59 | 10.22 | 27.93 | 8.22 |
| 16. Division | 27.27 | 10.70 | 13.86 | 9.95 |
| 17. Subtraction & Multiplication | 46.08 | 13.00 | 32.61 | 11.39 |
| 18. Raven Progressive Matrices (A) | 11.42 | 0.79 | 11.19 | 0.90 |
| 19. Raven Progressive Matrices (B) | 10.68 | 1.52 | 9.49 | 2.39 |
| 20. Raven Progressive Matrices (C) | 9.64 | 1.55 | 7.79 | 2.44 |
| 21. Raven Progressive Matrices (D) | 9.03 | 1.62 | 7.89 | 2.50 |
| 22. Raven Progressive Matrices (E) | 7.18 | 2.20 | 5.15 | 2.54 |
| 23. Hidden Figures | 9.49 | 4.54 | 7.43 | 3.99 |
| 24. Hidden Patterns | 78.50 | 20.52 | 66.77 | 18.92 |
| 25. GEFT (Witkin) | 13.05 | 4.21 | 11.56 | 4.70 |
| 26. Gestalt Completion | 10.68 | 3.65 | 11.77 | 3.35 |
| 27. Concealed Words | 15.42 | 4.77 | 17.14 | 5.00 |
| 28. Letter Sets | 14.48 | 4.95 | 12.26 | 4.85 |
| 29. Figure Classification | 91.14 | 28.51 | 93.31 | 40.04 |
| 30. Cube Comparisons | 24.56 | 5.52 | 21.06 | 5.37 |
| 31. Card Rotation | 105.97 | 36.32 | 101.74 | 36.66 |
| 32. Form Board | 97.90 | 38.11 | 103.09 | 37.49 |

# APPENDIX VI

## INTERCORRELATIONS AMONG ABILITY MEASURES FOR CHINESE AND MALAY SAMPLES

## APPENDIX VI

### INTERCORRELATIONS* AMONG ABILITY MEASURES

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | - | -01 | 25 | 28 | 46 | 10 | 26 | 18 | 23 | 24 | 23 | 34 | 28 | 30 | 20 | 26 | -19 | 07 | 21 | 20 |
| 2 | 22 | - | 21 | 30 | 03 | 26 | 06 | 14 | 10 | 14 | -07 | 08 | 12 | 16 | -01 | 18 | 13 | -07 | -11 | -08 |
| 3 | 31 | 40 | - | 25 | 39 | 04 | 34 | 17 | 28 | 28 | 17 | 17 | 37 | 26 | 25 | 33 | 30 | 13 | 22 | 30 |
| 4 | 31 | 48 | 32 | - | 15 | 20 | 09 | 03 | 05 | 09 | 03 | 20 | 12 | 21 | 01 | 02 | 04 | -06 | 18 | 05 |
| 5 | 37 | 47 | 24 | 40 | - | 20 | 41 | 28 | 47 | 36 | 34 | 42 | 44 | 39 | 17 | 33 | 26 | 08 | 27 | 23 |
| 6 | 13 | 48 | 18 | 38 | 34 | - | 13 | 11 | 21 | 13 | 13 | 35 | 31 | 32 | -05 | 22 | 12 | -08 | -03 | 05 |
| 7 | 21 | 29 | 31 | 34 | 32 | 09 | - | 59 | 66 | 71 | 53 | 29 | 35 | 15 | 13 | 32 | 24 | 13 | 25 | 30 |
| 8 | 24 | 40 | 24 | 35 | 27 | 15 | 70 | - | 68 | 74 | 61 | 15 | 19 | 08 | 04 | 21 | 20 | -02 | 04 | 13 |
| 9 | 23 | 44 | 28 | 40 | 37 | 19 | 69 | 75 | - | 72 | 65 | 32 | 43 | 24 | 13 | 37 | 22 | 18 | 23 | 36 |
| 10 | 24 | 38 | 40 | 39 | 35 | 17 | 74 | 82 | 76 | - | 63 | 32 | 38 | 22 | 17 | 34 | 27 | 10 | 16 | 33 |
| 11 | 27 | 30 | 24 | 29 | 19 | 08 | 62 | 59 | 66 | 59 | - | 30 | 38 | 17 | 12 | 28 | 17 | 16 | 20 | 25 |
| 12 | 21 | 43 | 19 | 38 | 36 | 51 | 21 | 22 | 23 | 20 | 20 | - | 58 | 64 | 09 | 35 | 21 | 03 | 21 | 33 |
| 13 | 15 | 22 | 22 | 17 | 27 | 30 | 11 | 04 | 17 | 16 | 05 | 40 | - | 65 | 34 | 56 | 44 | 05 | 21 | 38 |
| 14 | 18 | 22 | 15 | 21 | 27 | 39 | 18 | 11 | 13 | 15 | 08 | 56 | 69 | - | 22 | 43 | 40 | 02 | 15 | 27 |
| 15 | 09 | 19 | 34 | 09 | 15 | 07 | 13 | 08 | 10 | 14 | 04 | 11 | 33 | 13 | - | 50 | 70 | -11 | 04 | 14 |
| 16 | 13 | 28 | 31 | 07 | 35 | 25 | 11 | 08 | 12 | 16 | 07 | 20 | 45 | 32 | 47 | - | 66 | 04 | 15 | 14 |
| 17 | 09 | 23 | 26 | 06 | 20 | 22 | 04 | 07 | 03 | 10 | -06 | 19 | 45 | 29 | 67 | 68 | - | -15 | 10 | 15 |
| 18 | 05 | 20 | -04 | 06 | 18 | -06 | 06 | 08 | 07 | 07 | 13 | 06 | 04 | 02 | 04 | -03 | -06 | - | 40 | 28 |
| 19 | 10 | 03 | -03 | 06 | 09 | 05 | 07 | 07 | 13 | 03 | 10 | 19 | 19 | 09 | 13 | 07 | 12 | 21 | - | 51 |
| 20 | 23 | 21 | 33 | 26 | 27 | 24 | 10 | 14 | 22 | 17 | 09 | 23 | 32 | 25 | 18 | 13 | 19 | 26 | 31 | - |
| 21 | -03 | 09 | 03 | 06 | 02 | -00 | -01 | -04 | 13 | 00 | -03 | 02 | 20 | -00 | 19 | 02 | 09 | 16 | 30 | 33 |
| 22 | 11 | 20 | 33 | 24 | 14 | 09 | 20 | 10 | 20 | 23 | 12 | 11 | 22 | 13 | 14 | 04 | 10 | 15 | 20 | 43 |
| 23 | 09 | 23 | 24 | 34 | 26 | 08 | 31 | 22 | 32 | 27 | 30 | 23 | 34 | 30 | 04 | 25 | 15 | 07 | 10 | 30 |
| 24 | 16 | 23 | 25 | 23 | 25 | 04 | 19 | 19 | 24 | 20 | 29 | 20 | 27 | 30 | 23 | 31 | 32 | 14 | 10 | 32 |
| 25 | 08 | 26 | 11 | 22 | 26 | 18 | 18 | 19 | 26 | 20 | 25 | 12 | 23 | 16 | -01 | 17 | 09 | 22 | 17 | 31 |
| 26 | 10 | 17 | 11 | 25 | 07 | 07 | 22 | 23 | 26 | 23 | 31 | 12 | 08 | 05 | -02 | -05 | -09 | 14 | 02 | 26 |
| 27 | 12 | 13 | 08 | 09 | 09 | 00 | 08 | 07 | 15 | 13 | 22 | 19 | 25 | 16 | 26 | 15 | 17 | 14 | 23 | 23 |
| 28 | 22 | 26 | 35 | 31 | 27 | 22 | 25 | 14 | 26 | 22 | 21 | 25 | 34 | 24 | 27 | 23 | 24 | 07 | 07 | 20 |
| 29 | -00 | 04 | -01 | 02 | 12 | -01 | 07 | 19 | 19 | 16 | 17 | -04 | 01 | -00 | -00 | 05 | 07 | 03 | -03 | -07 |
| 30 | 14 | 22 | 14 | 12 | 19 | 15 | 24 | 23 | 27 | 20 | 21 | 18 | 23 | 12 | 26 | 18 | 23 | 06 | 08 | 17 |
| 31 | 10 | 33 | 10 | 17 | 15 | 17 | 03 | 10 | 09 | 05 | 12 | 18 | 08 | 07 | 03 | 12 | 08 | 15 | 03 | 04 |
| 32 | -01 | -08 | 07 | -03 | -09 | -16 | 16 | 05 | 09 | 05 | 17 | -08 | -02 | -07 | 04 | -04 | -01 | -04 | -19 | -08 |

LOWER TRIANGLE = CHINESE INTERCORRELATIONS, UPPER TRIANGLE = MALAY INTERCORRELATIONS

*Decimal points omitted

| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 25 | 17 | 14 | 26 | 00 | 09 | 29 | 03 | 18 | 11 | 03 |
| -02 | 03 | -09 | 01 | 02 | -12 | 07 | 17 | -02 | 07 | 00 | -06 |
| 31 | 25 | 18 | 28 | 36 | -10 | 06 | 39 | 07 | 21 | 10 | -04 |
| -01 | 15 | 05 | 02 | 10 | 09 | 24 | 10 | -13 | 07 | -08 | -15 |
| 25 | 30 | 23 | 33 | 41 | -07 | 10 | 36 | 07 | 13 | 08 | -11 |
| -01 | 05 | 10 | 02 | 22 | 13 | 13 | 16 | 01 | 01 | 10 | -06 |
| 20 | 31 | 13 | 20 | 30 | -04 | 13 | 35 | 21 | 23 | 12 | -05 |
| -00 | 10 | 09 | 06 | 17 | -03 | 08 | 19 | 11 | 10 | 03 | -08 |
| 16 | 28 | 14 | 18 | 38 | -08 | -03 | 32 | 15 | 22 | 08 | -13 |
| 15 | 28 | 09 | 18 | 32 | -03 | 12 | 36 | 09 | 20 | 12 | -11 |
| 06 | 24 | 22 | 20 | 37 | 03 | -01 | 29 | 09 | 26 | 06 | -08 |
| 15 | 34 | 16 | 16 | 46 | 08 | 09 | 45 | -10 | 07 | -01 | -29 |
| 23 | 33 | 25 | 24 | 50 | 03 | 12 | 49 | -08 | 11 | 12 | -12 |
| 23 | 30 | 18 | 19 | 42 | 15 | 12 | 46 | -14 | 03 | 01 | -16 |
| 11 | 21 | 18 | 28 | 14 | 00 | 15 | 25 | 07 | 12 | 15 | 09 |
| 21 | 31 | 09 | 17 | 25 | 01 | -01 | 36 | 15 | 04 | 16 | -01 |
| 19 | 13 | 14 | 18 | 17 | 04 | 10 | 28 | 13 | 12 | 09 | 09 |
| 26 | 20 | 07 | 16 | 16 | -04 | -12 | 08 | -06 | 21 | 01 | -01 |
| 50 | 39 | 12 | 19 | 36 | 01 | -02 | 20 | -06 | 13 | -07 | -14 |
| 51 | 57 | 21 | 32 | 40 | -05 | 01 | 35 | -07 | 17 | -11 | -14 |
| - | 45 | 15 | 24 | 38 | 03 | 04 | 30 | -04 | 04 | -02 | 06 |
| 29 | - | 22 | 29 | 38 | 03 | 02 | 38 | -00 | 18 | 04 | -21 |
| 10 | 30 | - | 45 | 44 | 22 | 21 | 13 | -06 | 29 | 10 | 07 |
| 19 | 33 | 56 | - | 43 | 04 | 11 | 24 | -03 | 19 | 14 | -10 |
| 08 | 29 | 54 | 47 | - | 24 | 17 | 46 | 05 | 09 | 01 | -15 |
| 23 | 15 | 30 | 32 | 35 | - | 34 | -06 | 05 | -00 | 01 | 09 |
| 26 | 18 | 14 | 36 | 19 | 41 | - | 10 | -09 | 15 | 05 | -03 |
| 17 | 28 | 26 | 20 | 14 | 15 | 15 | - | 03 | 16 | 19 | 02 |
| -09 | -03 | 16 | 15 | 11 | 08 | -09 | 14 | - | -05 | 14 | 22 |
| 18 | 31 | 16 | 07 | 10 | 06 | -01 | 23 | 10 | - | 21 | 15 |
| 06 | 04 | 18 | 22 | 12 | 18 | 02 | 15 | 14 | 27 | - | 29 |
| 15 | -04 | 24 | 10 | 03 | 11 | -04 | 10 | 28 | 23 | 23 | - |

Test Designations:

1 = Directions
2 = Verbal Opposites
3 = Numerical Series
4 = Verbal Analogies
5 = Simple Arith. Comp.
6 = Synonyms
7 = Analogies
8 = Sames
9 = Subtractions
10 = Series
11 = Superimpositions
12 - Reading
13 = Maths.
14 = Science
15 = Addition
16 = Division
17 = Sub. + Mult.
18 = RPM Set A
19 = RPM Set B
20 = RPM Set C
21 = RPM Set D
22 = RPM Set E
23 = Hidden Figures
24 = Hidden Patterns
25 = GEFT (Witkin)
26 = Gestalt Completion
27 = Concealed Words
28 = Letter Sets
29 = Fig. Classification
30 = Cube Comparison
31 = Card Rotation
32 = Form Board

# APPENDIX VII

## MEANS AND STANDARD DEVIATIONS OF AFFECTIVE, PROCESS, AND STATUS VARIABLES FOR CHINESE AND MALAY SAMPLES

## APPENDIX VII

### MEANS AND STANDARD DEVIATIONS OF VARIABLES IN 1) AFFECTIVE, 2) PROCESS AND 3) STATUS DOMAINS

| | CHINESE | | MALAYS | |
|---|---|---|---|---|
| 1) AFFECTIVE DOMAIN | MEANS | S.D. | MEANS | S.D. |
| 1. Acceptance | 34.98 | 6.90 | 36.28 | 5.29 |
| 2. Childcentredness | 17.32 | 3.50 | 18.21 | 2.85 |
| 3. Possessiveness | 16.60 | 2.93 | 16.86 | 2.63 |
| 4. Rejection | 24.92 | 5.27 | 27.11 | 5.10 |
| 5. Control | 18.01 | 3.03 | 17.72 | 2.90 |
| 6. Enforcement | 15.08 | 3.26 | 15.71 | 3.22 |
| 7. Positive Involvement | 32.88 | 6.45 | 35.10 | 4.89 |
| 8. Intrusiveness | 17.41 | 3.60 | 17.24 | 3.24 |
| 9. Control through Guilt | 15.57 | 3.67 | 16.70 | 2.91 |
| 10. Hostile Control | 32.81 | 5.09 | 33.96 | 4.28 |
| 11. Inconsistent Discipline | 12.94 | 2.88 | 14.63 | 2.76 |
| 12. Nonenforcement | 11.84 | 2.86 | 13.57 | 2.90 |
| 13. Acceptance of Individuation | 33.42 | 5.62 | 33.51 | 4.52 |
| 14. Lax Discipline | 13.81 | 2.72 | 14.98 | 2.63 |
| 15. Instilling Persistent Anxiety | 15.67 | 3.23 | 15.62 | 2.98 |
| 16. Hostile Detachment | 24.95 | 4.84 | 27.93 | 4.66 |
| 17. Withdrawal of Relations | 13.26 | 3.03 | 15.16 | 2.95 |
| 18. Extreme Autonomy | 12.59 | 3.24 | 13.92 | 3.49 |
| 2) PROCESS DOMAIN | | | | |
| 1. Press for School-achievement | 30.97 | 7.39 | 34.23 | 6.92 |
| 2. Press for Activeness | 31.74 | 6.44 | 31.22 | 6.39 |
| 3. Press for Intellectuality | 27.32 | 7.14 | 27.95 | 7.87 |
| 4. Press for Independence | 44.34 | 7.92 | 43.86 | 8.07 |
| 5. Model Identification | 3.67 | 2.33 | 3.21 | 2.12 |
| 6. Planfulness in Family | 4.01 | 1.36 | 4.45 | 1.53 |
| 7. Press for English | 14.38 | 6.51 | 16.20 | 7.44 |

| 3) STATUS DOMAIN | CHINESE MEANS | CHINESE S.D. | MALAYS MEANS | MALAYS S.D. |
|---|---|---|---|---|
| 1. Number of Siblings | 5.57 | 2.45 | 6.19 | 2.58 |
| 2. Father's Occupation | 3.63 | 1.33 | 3.20 | 1.09 |
| 3. Father's Education | 2.35 | 0.83 | 2.39 | 0.92 |
| 4. Mother's Occupation | 1.21 | 0.57 | 1.16 | 0.55 |
| 5. Mother's Education | 1.67 | 0.92 | 1.46 | 0.79 |
| 6. Home Induction to School Languages | 1.98 | 1.63 | 3.22 | 0.98 |
| 7. Type of House | 2.77 | 1.58 | 2.22 | 1.28 |
| 8. Material Wealth | 3.89 | 1.44 | 3.49 | 1.21 |
| 9. Highest Educational Level of Sib | 3.24 | 1.72 | 2.87 | 1.45 |
| 10. Educational Level of Highest Wage Earner, Not Parents | 1.86 | 1.44 | 1.73 | 1.29 |
| 11. Occupational Level of Highest Wage Earner, Not Parents | 2.02 | 1.71 | 1.76 | 1.39 |

## APPENDIX VIII

INTERCORRELATIONS AMONG 1) AFFECTIVE VARIABLES, 2) PROCESS VARIABLES, AND 3) STATUS VARIABLES FOR CHINESE AND MALAY SAMPLES

## APPENDIX VIII

### INTERCORRELATIONS* AMONG STATUS-VARIABLES

| Status Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Number of Siblings | - | -03 | -01 | -14 | -12 | 10 | -02 | -00 | 21 | 22 | 20 |
| 2. Father's Occupation | -09 | - | 55 | 11 | 27 | 08 | 17 | 23 | 14 | 03 | 03 |
| 3. Father's Education | -16 | 50 | - | 11 | 42 | 12 | 17 | 21 | 12 | -03 | -06 |
| 4. Mother's Occupation | -18 | -10 | -05 | - | 42 | 12 | -05 | 10 | -05 | 06 | 03 |
| 5. Mother's Education | -23 | 37 | 52 | 10 | - | 06 | 12 | 09 | 02 | -05 | -04 |
| 6. Home Induction to Sch. Instructional Langs. | 01 | 02 | 05 | 05 | 12 | - | 06 | 06 | 05 | 15 | 15 |
| 7. Type of House | 10 | 51 | 43 | -07 | 27 | 11 | - | 29 | 14 | 08 | 08 |
| 8. Material Wealth | 09 | 46 | 42 | -12 | 26 | 03 | 49 | - | 12 | 04 | 06 |
| 9. Highest Educationsl Level of Sibling | 29 | 08 | 11 | 02 | 09 | 10 | 21 | 23 | - | 37 | 34 |
| 10. Education of Highest Wage Earner, Not Parents | 22 | -05 | 01 | 01 | 00 | -03 | -03 | 02 | 36 | - | 94 |
| 11. Occ. of Highest Wage Earner, Not Parents | 23 | -02 | -01 | 04 | -02 | -02 | 01 | 04 | 34 | 94 | - |

*Decimal points omitted
Values above diagonal represent Malay data, below diagonal Chinese data.

### INTERCORRELATIONS* AMONG PROCESS-VARIABLES

| Process Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Press for School-achievement | - | 27 | 31 | -11 | 13 | 30 | 35 |
| 2. Press for Activeness | 34 | - | 43 | 05 | 23 | 26 | 48 |
| 3. Press for Intellectuality | 28 | 25 | - | -05 | 27 | 29 | 36 |
| 4. Press for INdependence | -30 | -09 | -09 | - | 02 | -09 | -01 |
| 5. Model Identification | 28 | 26 | 19 | -13 | - | 10 | 17 |
| 6. Planfulness in Family | 25 | 26 | 28 | -19 | 20 | - | 31 |
| 7. Press for English | 33 | 46 | 41 | -11 | 28 | 24 | - |

*Decimal points omitted
Values above diagonal represent Malay data, below diagonal Chinese data.

INTERCORRELATIONS* AMONG AFFECTIVE VARIABLES

| Affective Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Acceptance | - | 65 | 39 | -03 | 39 | 17 | 71 | 40 | 27 | 27 | 07 | -12 | 61 | 14 | 16 | -11 | 21 | 03 |
| 2. Childcentredness | 74 | - | 41 | 01 | 35 | 20 | 64 | 40 | 25 | 27 | 09 | -12 | 49 | 15 | 12 | 03 | 26 | 04 |
| 3. Possessiveness | 49 | 56 | - | 18 | 30 | 27 | 33 | 41 | 35 | 34 | 25 | -05 | 29 | 26 | 36 | 21 | 42 | -04 |
| 4. Rejection | -21 | -06 | 23 | - | 05 | 42 | 04 | 19 | 27 | 20 | 52 | 40 | 13 | 31 | 43 | 62 | 47 | 25 |
| 5. Control | 32 | 40 | 51 | 25 | - | 40 | 34 | 51 | 34 | 49 | 16 | -07 | 26 | 02 | 34 | 08 | 32 | -18 |
| 6. Enforcement | 16 | 28 | 37 | 45 | 67 | - | 27 | 38 | 35 | 43 | 38 | 15 | 16 | 19 | 45 | 37 | 45 | -02 |
| 7. Positive Involvement | 83 | 81 | 57 | -08 | 43 | 25 | - | 38 | 30 | 25 | 12 | -02 | 58 | 20 | 21 | -00 | 32 | 08 |
| 8. Intrusiveness | 49 | 57 | 55 | -01 | 55 | 34 | 63 | - | 36 | 49 | 14 | -02 | 32 | -01 | 33 | 08 | 32 | -23 |
| 9. Control through Guilt | 32 | 41 | 47 | 42 | 54 | 46 | 43 | 43 | - | 33 | 23 | -10 | 33 | 10 | 46 | 12 | 39 | -12 |
| 10. Hostile Control | 34 | 44 | 53 | 35 | 68 | 64 | 47 | 65 | 62 | - | 15 | 10 | 29 | 12 | 36 | 15 | 33 | -09 |
| 11. Inconsistent Discipline | 06 | 13 | 25 | 49 | 17 | 28 | 11 | 16 | 32 | 28 | - | 28 | 12 | 26 | 38 | 54 | 37 | 16 |
| 12. Nonenforcement | -07 | -08 | 06 | 48 | -15 | -03 | -10 | -22 | 05 | -09 | 43 | - | -03 | 18 | 04 | 48 | 28 | 41 |
| 13. Acceptance of Individuation | 73 | 57 | 41 | -24 | 26 | 04 | 71 | 50 | 26 | 29 | 09 | -07 | - | 30 | 20 | 07 | 32 | 26 |
| 14. Lax Discipline | 22 | 17 | 17 | 27 | -04 | -07 | 21 | 03 | 11 | 02 | 42 | 49 | 34 | - | 31 | 30 | 37 | 41 |
| 15. Instilling Persistent Anxiety | 14 | 29 | 52 | 38 | 61 | 58 | 26 | 46 | 66 | 63 | 31 | -03 | 17 | 06 | - | 34 | 49 | 02 |
| 16. Hostile Detachment | -27 | -10 | 14 | 67 | 12 | 34 | -13 | -02 | 26 | 24 | 43 | 43 | -27 | 21 | 35 | - | 48 | 32 |
| 17. Withdrawal of Relations | 01 | 08 | 37 | 55 | 41 | 52 | 13 | 20 | 44 | 49 | 43 | 14 | -02 | 17 | 44 | 46 | - | 22 |
| 18. Extreme Autonomy | 15 | 12 | -06 | 12 | -26 | -24 | 15 | -13 | 02 | -19 | 25 | 55 | 28 | 51 | -09 | 18 | -12 | - |

*Decimal points omitted
Values above diagonal represent Malay data, below diagonal Chinese data.

# APPENDIX IX

## SAMPLE ITEMS OF TEST MEASURES IN THE ABILITY DOMAIN